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FLIGHT

FEB 24 1933

The AIRCRAFT ENGINEER AND AIRSHIPS

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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EVERY THURSDAY

RLD'S RECORD

5340

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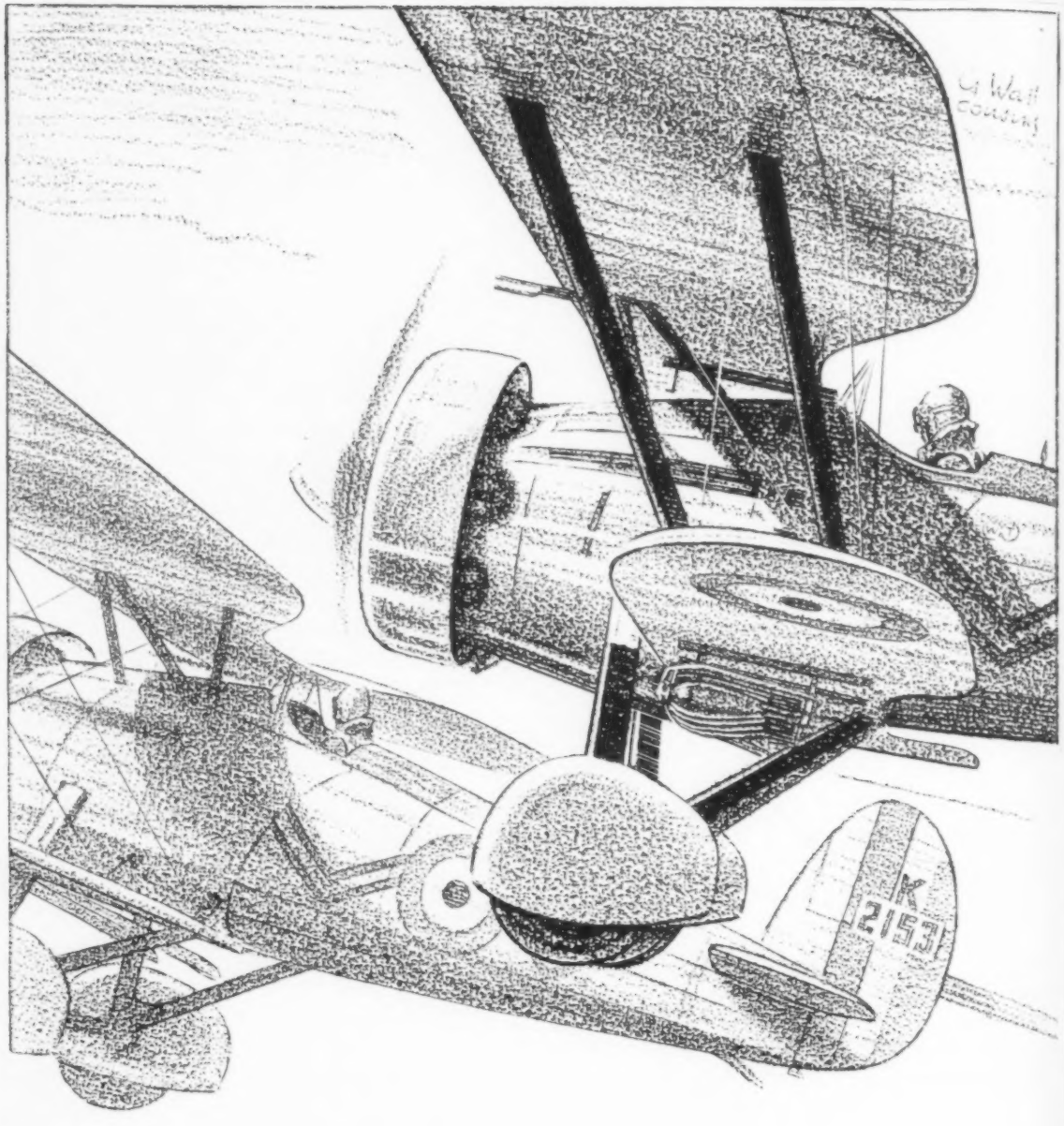
BY THE

AIREY

-PLANE MONOPLANE.



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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1933.
Feb. 16. "Cloud Formation," Lecture by Sir Gilbert Walker before R.Ae.S.
Feb. 18. Services Rugby: R.A.F. v. R.N., Twickenham 3 p.m.
Feb. 25. No. 41 (F.) Sqdn. R.A.F. Reunion Dinner.
Mar. 3. Leicester Ae.C. Dance at Palais-de-Dance, Leicester.
Mar. 4. No. 55 (F.) Sqdn. R.A.F. Reunion Dinner at R.A.F. Club.
Mar. 4. Services Rugby: R.N. v. The Army, Twickenham 3 p.m.
Mar. 8. "Recent Operations in Kurdistan," Lecture by Group-Capt. A. G. R. Garrod before R.U.S.I.
Mar. 9. "Engine Cooling Research." Lecture by R. McKinnon Wood before R.Ae.S.
Mar. 23. "Seaplane Research," Lecture by H. M. Garner before R.Ae.S.
Mar. 23. "The Value of Aircraft for Protecting Seaborne Trade." Lecture by Air Commodore C. D. M. Robertson, before R.U.S.I.
Mar. 24. No. 1 Sqdn. R.A.F. Reunion Dinner, at R.A.F. Club.
Mar. 24. Bristol and Wessex Ae.C. Dance at Grand Spa Hotel.
Mar. 25. Services Rugby: R.A.F. v. The Army, Twickenham 3 p.m.
Mar. 29. "The East African Dependencies." Lecture by H. F. Melland before R.U.S.I. Chairman, Air Vice-Marshal Sir V. Vyvyan.
Apr. 1. Women's R.A.F. Dinner, Criterion Restaurant.
May 10. Kent Air Pageant and Opening of Maidstone Aerodrome.
May 16-22. International Rally, Vienna.
May 25. Tourist Rally at Wiesbaden.
May 27. Reading Ae.C. Annual "At Home."
May 28. Deutsch de la Meurthe Cup.
Mar. 29. "The East African Dependencies." Lecture by H. F. Melland, before R.U.S.I. Chairman, Air Vice-Marshal Sir Vyell Vyvyan.
June 24. Royal Air Force Display, Hendon.

INDEX FOR VOL. XXIV.

The 8-page Index for Vol. XXIV of "Flight" and "The Aircraft Engineer," January to December, 1932 (with over 6,463 references for "Flight" and 195 references for "The Aircraft Engineer"—6,658 in all), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy, net (1s. 1d. post free).

EDITORIAL COMMENT

GAYFORD, Nicholetts, Uwins and Stainforth have gained for Great Britain the three most important official world's records in the air, and we fancy that no one in the world will have any hesitation in admitting that Great Britain is now the foremost flying nation. All honour to our great pilots! All honour, likewise, to the designers of the aircraft, engines and accessories which made possible the triumph of the pilots! In the case of each record it has been team work by all the parties which produced the very gratifying result, and in each case the result is all the more gratifying because of the dogged persistence which refused to be dashed by early failures.

The Long Distance Record and Others

In our moment of triumph we must remember Sqd. Ldr. Jones-Williams and Flt. Lt. Jenkins, who gave their lives in the first attempt to beat the long-distance record, and Flt. Lt. Bett, who died in hospital while waiting for a chance to make the second attempt. No better tribute could be paid to their memory than the ultimate success of Sqd. Ldr. Gayford and Flt. Lt. Nicholetts. Nor should we forget the three valiant attempts of Flt. Lt. C. R. Carr and his companions to fly non-stop to India in a "Horsley," with "Condor" engine. The first of these attempts, in May, 1927, ended in the Persian Gulf after covering 3,400 miles, and for about an hour this flight unofficially held the world's record

for non-stop distance in a straight line. But Lindbergh was in the air that day, and his New York-Paris flight speedily eclipsed the record made by Carr and Gillman. Carr's second attempt ended at Martlesham with the most wonderful landing ever made by any pilot in the whole history of flying. The third attempt ended in the Danube.

To start an attack on the long-distance record in 1927 and finally to capture it in 1933 shows considerable persistence on the part of the Air Ministry and the Royal Air Force. The success is all the more notable because in the final stages the claims of economy could not be disregarded. The Fairey monoplane which has accomplished the feat was produced early in 1929, and when the first machine crashed in December of that year, no new design was ordered. The second machine was in all important features a replica of the first. The design is now a good four years old, and we should not insult the Fairey Aviation Co., Ltd., by suggesting that they could not now turn out a much-improved design for long-distance work. The Napier engine is of a type which has been in existence for a long time and has frequently given proof of its reliability. The non-stop flight of Jones-Williams and Jenkins from Cranwell to Karachi in April, 1929, a great circle distance of 4,130 miles (though actually a very much greater distance was flown) in 50¾ hours was a very great triumph for the Napier engine. Again on this last flight the Napier ran for 57½ hours without faltering or giving the pilots a moment's anxiety. No better engine performance could be desired, but as regards the machine itself we may say that we have won this record without putting forth the best of which our designers are capable.

While the winning of this record has proved to be a task well within the powers of our designers and pilots, it has, none the less, not been an easy record for Great Britain to establish. Cranwell is the only aerodrome in the country large enough to permit such a very heavily loaded machine to take off, and even at Cranwell this was hardly possible without a west wind. After that, once the machine was in the air, a northerly wind became a necessity. The tankage of the machine allowed for a flight of 60 hours, and so the distance covered in that time depended on the vagaries of the wind. In this case the monoplane was slowed up somewhat when crossing France, but in North Africa the wind carried it ahead well in advance of its schedule. It was expected that conditions would be favourable in Nigeria, but actually it was Nigeria which proved the stumbling-block. Full reports of all the details of the flight have not yet been received, and we do not at the time of writing know all about the wanderings of the machine through the bad weather in Nigeria and French Equatorial Africa. In such conditions the automatic pilot should have been a great help, but unfortunately it went out of action, for some reason of which we are still ignorant. By Wednesday morning it was evident to us in London, as it was to the pilots themselves, that Capetown could not be reached, though the record line near the little station of Zesfontein was easily within reach. Thereafter another practical difficulty faced the pilots. When the monoplane is light she floats like a soap-bubble, and she cannot be landed on a small aerodrome without risk of damage. The pilots, it seems, flew on past Walvis Bay, and they may have had a look at the aerodrome at Luderitz and decided that it was not suitable. They might have been able to get on to Port Nolloth, but if they had reached there the petrol would certainly have been exhausted, and they would have had to come down whatever the size and surroundings of the aerodrome. It would have been gratifying to everyone if they could have landed at the utmost limit of their range, for that would have made a longer distance for the next aspirant after the record to beat, but very wisely they decided to get to Walvis Bay while they still had petrol in hand. Our pleasure in the making of the new record would have been sadly marred if there had been an accident in the final landing. We applaud the judgment of the pilots as much as we admire their skill and their endurance.

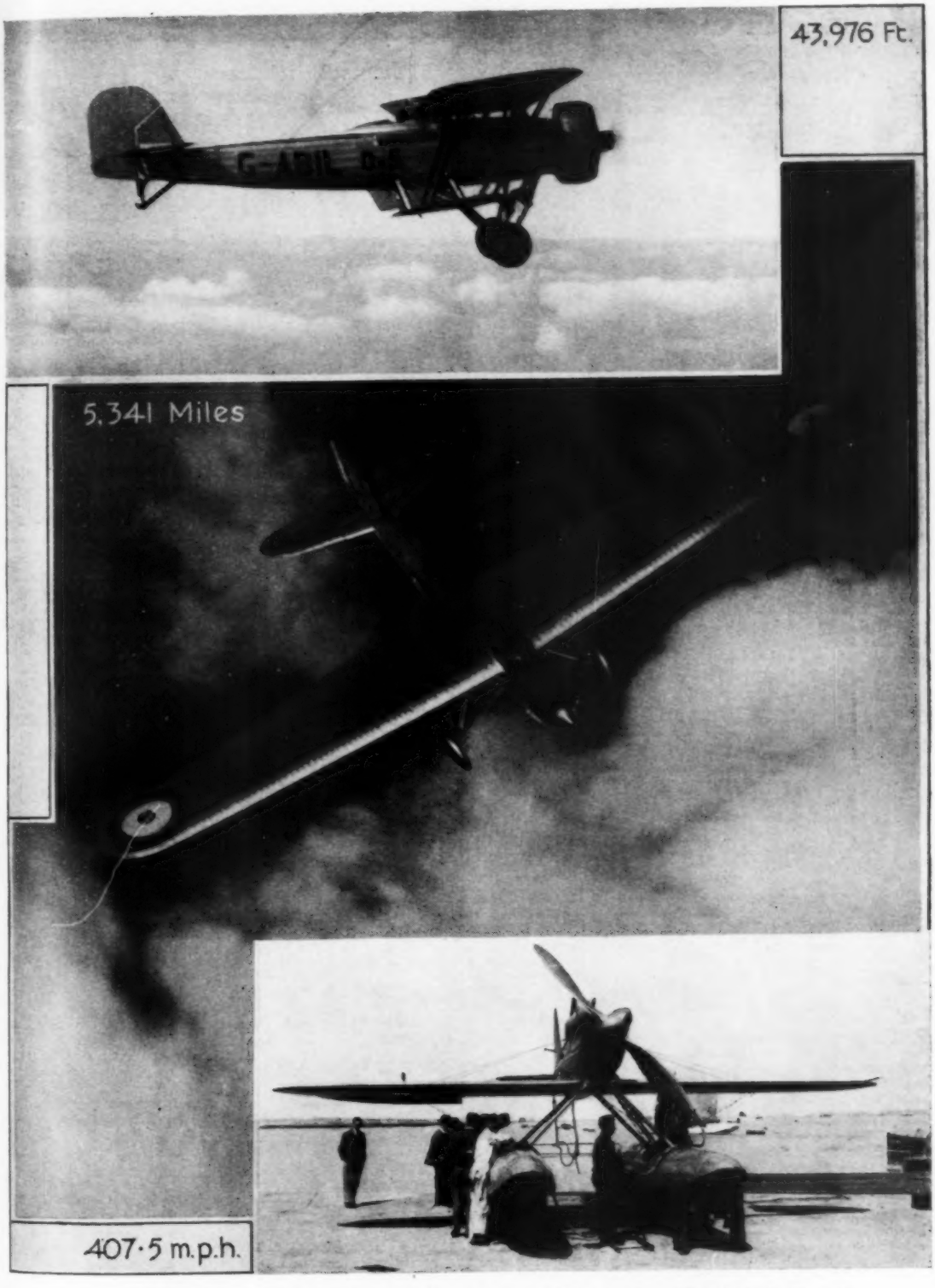
The Air Ministry has stated with emphasis that they set no store by the prospect of reaching Capetown. They knew, as we all knew, that whether the monoplane reached there or not was purely a gamble with winds. They did admit to the human frailty of wanting the machine to break the existing record, and they say they are quite contented with the outcome of the flight. Officially, the point which interested the Air Ministry was the testing out of our first type of long-range aeroplane. Our Empire is large and our Air Force is small. The latter has to compensate for its smallness by extra mobility. To reinforce some parts of the Empire in a hurry may at any time call for flights of long duration. At present, admittedly, we cannot reinforce Capetown; for even with a favouring wind all the way the monoplane could only just carry enough petrol to get itself and its crew of two to that city. But it might carry quite a useful load of necessities to, say, Nigeria in case of emergency, and it must be very comforting to the dwellers in that colony to know that such succour is available. The need may arise for machine guns or for medical drugs. If the wind at Cranwell is right, we can get them there in about two days and a night. That, of course, is with the present long-range monoplane. It is now for our designers to improve on that very good first attempt.

❖ ❖ ❖ ❖

Mr. Mollison does it again

Once more Mr. Mollison has given proof of his abilities as a long-range pilot, and once more the "Moth" and the "Gipsy Major" engine have shown how they can stand up to gruelling long flights. The world is getting small for our air tourists. Will they, we wonder, now turn their attention to rocket projectiles and the moon? Mr. Mollison's most extraordinary capability is his power of flying accurately and well when an ordinary pilot would be dead with fatigue. He must have been a tired man when he started from Africa across the South Atlantic, but his navigation did not fail him, and he arrived safely. It was a very great feat. South America is rapidly growing air-minded, but of late the Republics have seen more of great flights by foreign pilots than they have of British achievements. The arrival of Mr. Mollison should make them remember that Great Britain can build good aeroplanes and engines and that British pilots are second to none.

Three World's Records



Great Britain now holds the three most important world's records: The Altitude Record (Uwins on Vickers "Vespa" with Bristol "Pegasus" engine), the Distance Record (Gayford and Nicholetts on Fairey Monoplane Napier "Lion") and Speed Record (Stainforth on Supermarine S. 6 B with Rolls-Royce Engine). (FLIGHT *Photos.*)

R.A.F. Secures World's Distance Record

Cranwell-Walvis Bay in 57 hours 25 minutes

WHAT IT REPRESENTS: Had Gayford and Nicholetts chosen to go in a different direction, they would have reached, in a distance of 5,341 miles, any point within the circumference of the globe as shown in this photograph.

WHEN Sqd. Ldr. Gayford and Flt. Lt. Nicholetts brought the Fairey (Napier) to earth at Walvis Bay at 4.40 p.m. on Wednesday, February 8, they had secured by a very comfortable margin the world's record for non-stop flight in a straight line, which was previously held by the American pilots, Boardman and Polando, with a flight from New York to Istambul, the distance being 5,012 miles. Actually the distance covered by the course taken was something like 5,411 miles, but the great circle distance (which is the one with which the flight will be credited for record purposes) is 5,341 miles, which beats the previous record by 329 miles. Based upon actual distance covered, the Fairey long-range monoplane averaged 93.4 m.p.h., but on a basis of great-circle distance the speed was 93.2 m.p.h. Quite evidently head winds were encountered over considerable stages of the route, as at one time the machine appeared to be averaging 110 m.p.h. or so. Doubtless it was this head wind which caused the crew to terminate the flight at Walvis Bay instead of going on towards Cape Town, as had been planned. Incidentally, it was rather a pity that the Air Ministry let it become known that Cape Town was the goal and not Zesfontein. The latter place is 5,074 miles from Cranwell on a great-circle course, or 62 miles farther than the previous record. As this had to be beaten by at least 100 km. (62 miles) it would have made a suitable "official" goal. Then, when the machine landed at Walvis Bay, everyone would have been delighted and have talked of the wonder of beating the record by 329 miles. As it is, the general comment of the man in the street is "what a pity they did not reach Cape Town." In other words, instead of rejoicing over the flight, he is apt to regard it just a little in the light of a failure, which is, of course, as far from the truth as anything could well be. The flight was a tremendous success for everyone concerned.

In last week's issue we were able to give a brief account of the start from Cranwell, and of the earlier stages of the flight. The subsequent history is told partly by the wireless messages sent, in most cases direct, by the aircraft to the Air Ministry, and partly in the short report which the Air Ministry received by cable from Sqd. Ldr. Gayford on February 9. That report was as follows:

"The take off conditions at Cranwell were good, and the aircraft left the ground at 7.15 a.m. quicker than was expected. We flew below the clouds until south of Peterborough, where there was a gap through which we climbed.

"The automatic control was put into operation about

5,341 MILES WITHOUT A STOP: The Fairey (Napier) monoplane above the clouds. Inset, left, Sqd. Ldr. O. R. Gayford, D.F.C., and right, Flt. Lt. G. E. Nicholetts, A.F.C.

9 a.m. We had a glimpse of the Thames but no sight of the ground until about 11 o'clock. We could not identify our position, so kept on our course until we struck the Mediterranean, 20 miles West of Marseilles, about 1 p.m.

"We then set course for Sardinia, and later changed course for Tunis. The ground speed was good. Tunis was passed at 6 p.m. The sky was then clear.

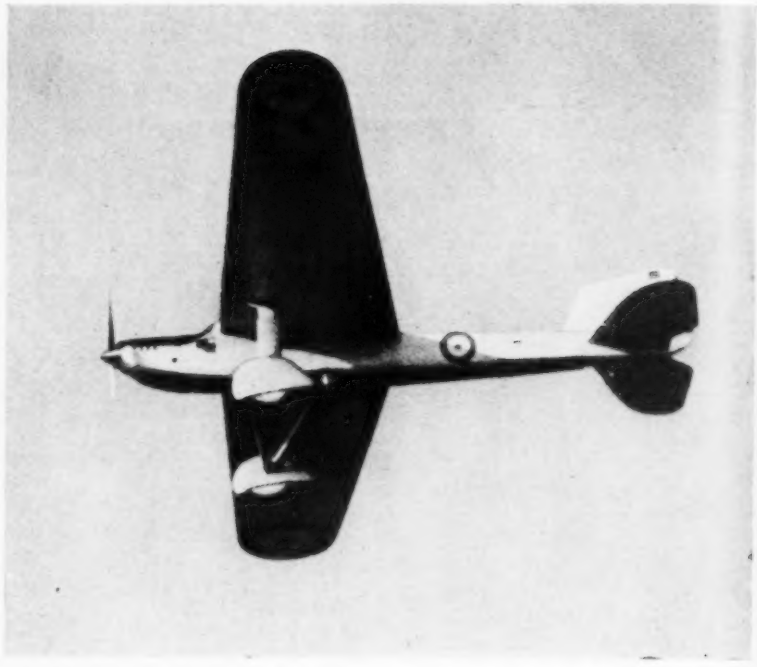
"We sighted Zafouan, Kairouan and Gabes which confirmed that the commencement of our track across the Sahara was correct. Flt. Lt. Nicholetts obtained excellent star sights at midnight. These enabled us to fix our position and to confirm that our course was correct. Broken high country eastward of the Ahaggar Plateau looked forbidding in the moonlight from the height of 8,000 ft. at which we were then flying, and even after the moon set at about 4 a.m. masses of towering rock could be seen below.

"Daylight at 5.30 a.m. revealed flat, featureless, desert country below, with rocky outcrops to the east. At 9 a.m. cultivated ground appeared below us, which indicated that Northern Nigeria had been entered. Here Harmattan dust haze commenced, reducing the visibility to a radius of a few miles only. It was impossible to identify our position.

"We passed over many good roads, and finally saw mines and railways, which indicated that we were over Bauchi Plateau. The automatic control showed signs of failure in the bumpy weather which was experienced about noon. The trouble was rectified by using the draincock. At about 1 p.m. heavy white towering cumulus cloud commenced which, combined with the dust haze, made navigation extremely difficult. A junction of rivers, which was thought to be Lokoja, was seen, and about one hour later mangrove swamps commenced, which indicated that we were approaching the coast.

"About 3.30 p.m. Mount Cameroon and the Island of Fernando Po appeared. Both were covered with cloud. We flew round them and settled on to the next leg of our course. The automatic control again required further correction by the use of the draincock.

"The sun set about 5.30 p.m. in a cloudy, stormy-looking sky. When darkness came on there was little help from the moon to assist in checking our drift or to enable us to identify our position.



AS THOUSANDS MAY HAVE SEEN IT: A view of the Fairey (Napier) monoplane flying nearly overhead. (FLIGHT *Photo.*)

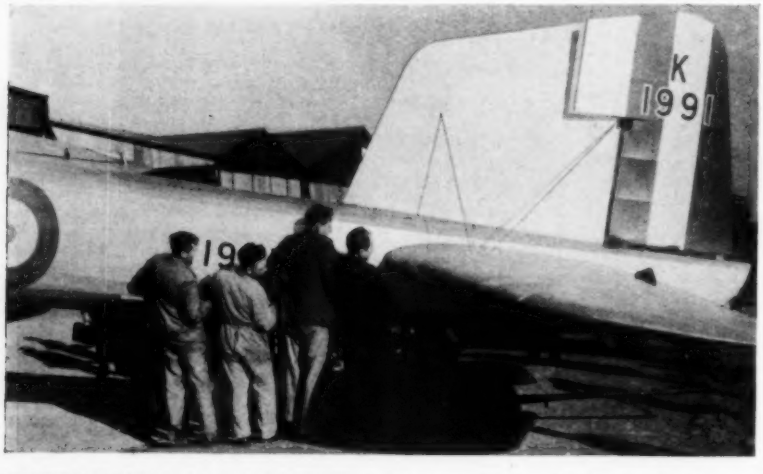
"About 7 p.m., when flying through rain clouds, the automatic control finally became completely unserviceable, and was out of action for the remainder of the flight. During the rest of the night we flew completely blind practically the whole time. The moon gave little help, and the clouds and bad visibility made it impossible, except for short periods, to get an horizon by which to fly.

"Dawn found us flying in a clear sky over undulating, park-like forest country, in which occasional houses and roads were to be seen. In order to fix our position we turned westward from our direct track, and struck the coast about 7 a.m.

"We identified what we thought to be Port Alexander and the mouth of the Kunene River. We followed the coast southward throughout the day without obtaining a precise position until late in the afternoon, when we found we were still north of Walvis Bay.

"We landed at Walvis Bay at 4.40 p.m. with less than 10 gallons of petrol left. The engine ran faultlessly for the 57 hr. 25 min. we were in the air, and we did not experience one qualm on its account throughout the whole flight."

Doubtless in due course a more detailed report of this magnificent flight will be issued. In the meantime we can but read between the lines and get occasional glimpses of the difficulties encountered. These appear to have been entirely of a navigational nature, as mechanical troubles appear to have been non-existing, with the exception of the ultimate failure of the mechanical "pilot" during the second night. Even this cannot be regarded as altogether damning the principle of the mechanical pilot. After all, it was put into service not long after leaving Cranwell, and from what can be gathered it did its work perfectly well for the first day, the first night, and at any rate part of the second day, so that it may be said to have relieved the crew of quite a deal



THE FEATHERS ON THE ARROW: This view of the tail gives, with the men standing by, a good idea of the size of the machine. (FLIGHT *Photo.*)

MUCH POWER, LITTLE DRAG: The nose of the Fairey monoplane. The Napier "Lion" engine is well cowled-in, the lines being completed by a spinner over the boss of the Fairey metal airscrew. The Palmer wheels are almost entirely "spatted." (FLIGHT *Photo.*)

of additional work during a large proportion of the flight.

The wireless reports sent out from the machine at intervals of two hours, and which we give in tabular form on this page, were mostly received by the Air Ministry direct, only about two messages being relayed, one by a private wireless station and the other by the R.A.E. station at Farnborough, which picked up the message from the machine. It would have been interesting to plot a graph of average speeds on the stages of the flight, but we found, when attempting to do this, that on a basis of times when the different places were flown over, and the distances between them and previous positions, that the average speeds varied from **186** m.p.h. to **60** m.p.h.! This obviously could only mean that either the wireless reports did not give the place flown over until some time after, or that the crew were uncertain of their exact position. The latter seems very unlikely, and the widely-differing speeds can be put down to the time lag between the machine actually passing over a certain place and the time of reporting it. Such a graph would give a wholly wrong impression, and we are not therefore publishing it.

On February 12, after a good rest, Gayford and Nicholetts continued their flight on to Cape Town, alighting at **4.30** p.m. at Wingfield aerodrome. It is estimated that the crowd which had gathered to welcome the Fairey (Napier) monoplane numbered **13,000**, and there is no doubt that the R.A.F. record flight has stirred the imagination and greatly impressed the population of South Africa, as indeed it has caused rejoicing and admiration through out the British Empire. When machine and engine have been thoroughly examined and overhauled, the homeward flight will be made in easy stages, probably along the Imperial Airways route. It is to be hoped that at all the aerodromes visited facilities will be given to as many people as possible to examine the monoplane which has attracted the attention of the whole world.

As soon as the result of the flight was known, His Majesty the King commanded Lord Londonderry to convey a message of congratulation to Sqd. Ldr. Gayford and Flt. Lt. Nicholetts.

The Prime Minister, Mr. Ramsay MacDonald, sent "Hearty Congratulations."

Lord Londonderry, Secretary of State for Air, sent the following message: "Hearty congratulations on successful completion of your magnificent flight and achievement of world's non-stop long distance record. The Royal Air

Progress of Flight as reported by Wireless :—

G.M.T.	**Monday, February 6**
7.15	Left Cranwell.
8.00	Passed Duxford.
10.00	Nearing Paris.
12.00	30 miles west of Lyons.
14.00	Near Avignon.
15.00	Over Marseilles.
16.00	Lat. 42° 10′ N. Aircraft O.K.
17.40	Passing Cagliari.
19.45	Passing over Kairouan. Machine on its course.
22.00	Passing over Gabes. All satisfactory.
23.30	520 miles south of Tunis.
	Tuesday, February 7
02.00	Passing over Rhat ; lat. 25′ N.
04.00	Lat. 21° 35′ N. O.K. and on track.
06.00	Lat. 18° 30′ N., long. 10° E.
08.00	Lat. 14° 46′ N., long. 9° 52′ E. On track, O.K.
14.00	Private wireless report Nigerian coast.
16.00	Passed Duala.
18.00	Report to R.A.E., position 200 miles south of Duala.
20.00	60 miles south-east of Libreville. Flying above and through thick clouds.
22.00	Lat. 3° 20′ south. O.K.
Midnight	Passing over Point Noire.
	Wednesday, February 8
02.00	Passing over Ambrizette. O.K.
04.00	Lat. 10° 20′ south.
06.00	43 miles S.E. of Benguella.
08.00	Passing Porto Alexandre.
12.00	30 miles north of Walvis Bay.
16.40	Landed at Walvis Bay.

It was later announced that the noon message giving the position as 30 miles north of Walvis Bay gave a wrong position, the machine at that time being much farther north of Walvis Bay.

Force has once again triumphantly demonstrated the supremacy of British pilots, aircraft and aero engines."

The message of the Air Council read: "The Air Council send you their warmest congratulations on the great achievement. It brings the highest credit to the Royal Air Force and to British industry."

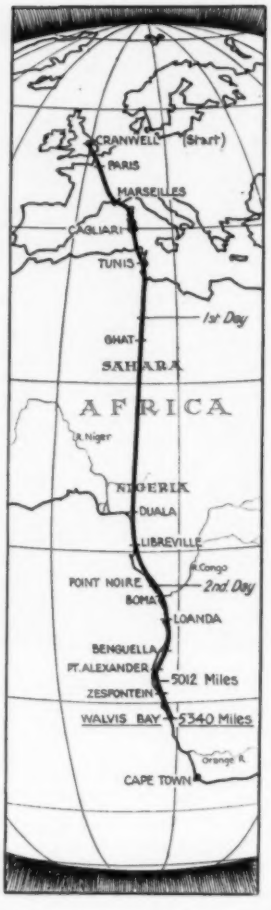
The French Air Minister, M. Pierre Cot, sent the following telegram to Lord Londonderry: "I have great pleasure in conveying to you and to the Royal Air Force the heartiest congratulations of all French airmen, and my own personal congratulations, on the magnificent achievement of Squadron Leader Gayford and Flight Lieutenant Nicholetts of the Royal Air Force."

The French Chief of the Air Staff sent to Sir John Salmond, the British Chief of the Air Staff, the following message: "On behalf of the French Air Force, I send warmest congratulations on the splendid flight by Gayford and Nicholetts."

The Royal Aeronautical Society's message read: "President and Council congratulate you on your fine and amazing achievement. Ultimately the careful preparations, the unique skill in design of the British aeroplane and engine and all the co-ordination of vital information must culminate in complete reliance on the skill, courage and persistent endeavour of the human element. These qualities are those very qualities which are shown in such a high degree by the Royal Air Force and have led to your triumphant and well-deserved success."

The Fairey Monoplane

In marvelling at the magnificent achievement of the Fairey long-range monoplane, one should bear in mind that the machine was actually designed about five years ago! At that time the world's non-stop record stood at a much lower figure than that which the Fairey machine had to beat last week, and thus it is seen that at the time the designers finished their drawings the monoplane was a great deal farther ahead of any other types than it is to-day. The first machine, it will be remembered, came to grief in the eastern end of the Atlas Mountains while on a non-stop flight from London to South Africa, Sqd. Ldr. Jones-Williams and Flt. Lt. Jenkins being killed.



THE ROUTE FOLLOWED: The African equivalent of the previous record was reached about 100 miles north of Zesfontein.

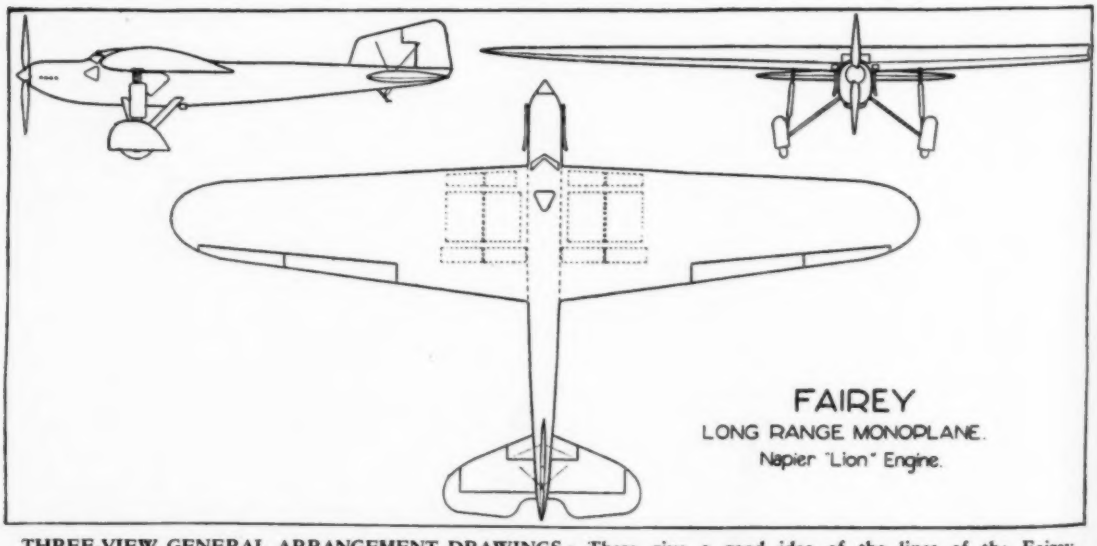
The second machine, which is the one which broke the record last week, was not put in hand for some considerable time, but ultimately it was finished, and it then became a question of waiting for suitable weather conditions for the record attempt. So that nothing should be left to chance, the machine was given a thorough try-out by a non-stop flight from Cranwell to Egypt in October, 1931. The crew on that occasion consisted of Sqd. Ldr. Gayford and the late Flt. Lt. Bett. Egypt was reached in 31 hours' flying through far from good weather conditions, and the automatic pilot proved its value by enabling the machine to keep on its course through clouds a large proportion of the way.

The second monoplane is to all intents and purposes identical with the first in all essentials. The instrument equipment is, however, a good deal better than that of the first machine, full advantage having been taken of the developments which took place in the interval. The greatest improvement was, of course, the installation of the automatic pilot.

Of other improvements mention may be made of the better facilities provided for the navigator, and the addition of a sliding hatch in the roof of the cabin, which enables the navigator to take star sights. The petrol system was improved by incorporating a special venting system designed to minimise the loss of fuel by evaporation.

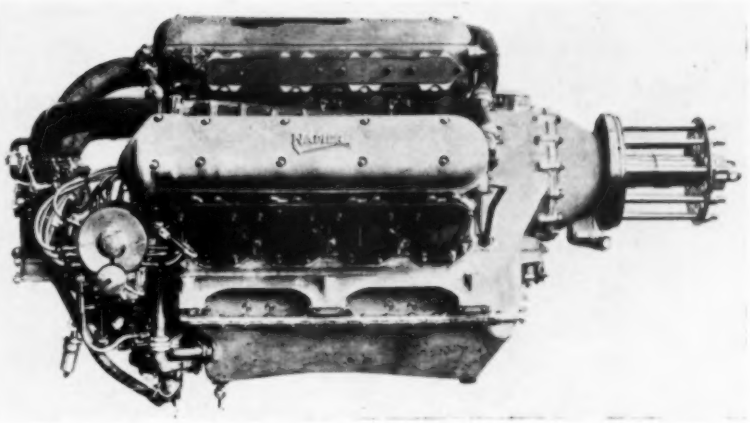
Improvements in the aerodynamic efficiency, which was already exceptionally high in the first machine, were made by fitting "spats" over the Palmer wheels.

The Fairey long-range monoplane is a high-wing machine, largely of wood construction. The fabric-covered monoplane wing is a pure cantilever structure, and to obtain torsional rigidity a special form of spar construction has been adopted, which constitutes a Fairey patent. The tapered wing employed has been found to have very good aerodynamic qualities, with a high maximum lift coefficient, and no sudden drop in the lift coefficient when the angle of maximum lift is exceeded. In other words, the machine does not stall suddenly. The tail plane is, like the main wing, a cantilever, and the only external bracing is the two streamline wires which brace the fin. The wing span of the machine is



THREE-VIEW GENERAL ARRANGEMENT DRAWINGS: These give a good idea of the lines of the Fairey monoplane. The petrol tanks are in the wing.

82 ft. and the overall length 48 ft. 6 in. The wing area is approximately 800 sq. ft. At the time of the start from Cranwell the machine is believed to have weighed something like 17,000 lb., so that the wing loading at the start must have been in the neighbourhood of 21 lb./sq. ft. The Napier "Lion XI A" engine develops a maximum of 570 b.h.p. at 2,585 r.p.m., so that the power loading at the start was nearly 30 lb./b.h.p. That the machine should be able to take off safely with such high loadings indicates that the drag at the angle of incidence corresponding to the take-off speed must be remarkably low. That the machine took nearly three-quarters of a mile to get off is not to be wondered at, and in this connection one must express admiration for the Palmer wheels and tyres which stood up to the enormous stresses during the early stages of the take-off.

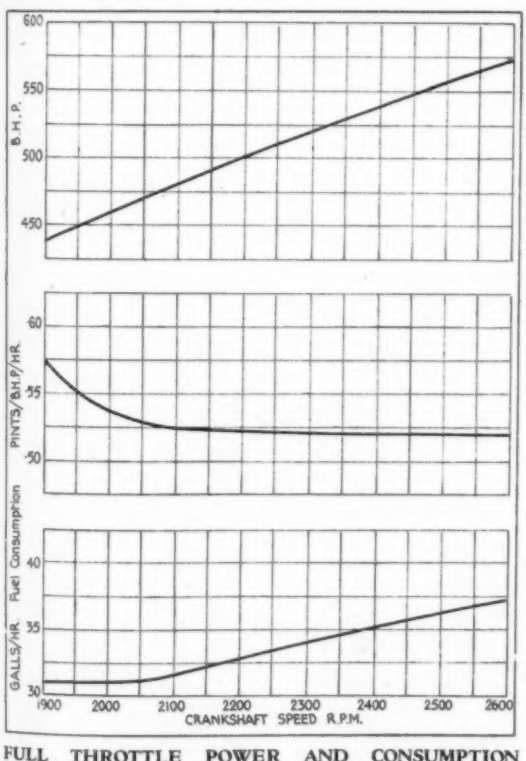


"NOT ONE QUALM ON ITS ACCOUNT": The Napier "Lion" XI A Engine.

A diagrammatic representation of the Fairey long-range monoplane will be found on p. 148, and from this a fairly good idea of the internal arrangement can be formed.

The "Lion's Share"

In a flight of the nature of a long-distance record, or indeed on most flights, the power plant is the factor on which almost everything depends. Not only must the engine continue to develop its power, but its petrol consumption must, if the full range is to be obtained, be as low as possible consistent with the necessary power being developed and the mixture not being unduly weak. The Napier "Lion" fitted in the Fairey monoplane appears to have done everything any engine could have done, and the concluding paragraph of Sqd. Ldr. Gayford's brief report is significant: "The engine ran faultlessly for the 57 hours 25 minutes we were in the air, and we did not experience one qualm on its account throughout the whole flight." The average petrol consumption during the flight was 20 gallons per hour, which must be regarded as remarkably low. It indicates that had the winds been a little more kind than they were on certain stages of the flight, Capetown could have been reached.



FULL THROTTLE POWER AND CONSUMPTION CURVES: The engine had a compression ratio of 6:1. The fuel used was 75 per cent. standard Aviation spirit and 25 per cent. benzole.

The Napier "Lion XI A" used on the flight from Cranwell to Walvis Bay was a perfectly standard production engine, with the exception that naturally the carburettors were tuned for economy, while pistons giving a slightly higher compression ratio than normal were fitted. The "Lion" is, it will be recollected, a 12-cylinder water-cooled engine with its cylinders arranged in three banks of four each. The bore is 5½ in. (139.7 mm.) and the stroke 5½ in. (130.175 mm.), giving a cubic capacity of 1,460 cu. in. (23.925 litres). The compression ratio is 6:1, and the normal power 530 b.h.p. at a crankshaft speed of 2,350 r.p.m. The maximum power is 570 b.h.p. at 2,585 r.p.m. The Fairey metal airscrew is geared down for better efficiency, the gear ratio being 1 to 1.885. The weight of the engine dry is approximately 995 lb., including airscrew boss, reduction gear, hand-starting gear less magneto. Ignition is provided by B.T.H. magnetos firing K.L.G. plugs. The carburettor is of the triple Napier-Claudel type, and, as already mentioned, was tuned for maximum fuel economy.

The Rest of the "Team"

A non-stop flight of 57½ hours calls for the best of everything, materials, specification, workmanship, inspection, assembly and so forth, and the record just established has proved beyond any possible question that British materials are very much in the "A1" class.

In addition to such equipment and components as have already been mentioned, it should be placed on record that the following British products helped to success:

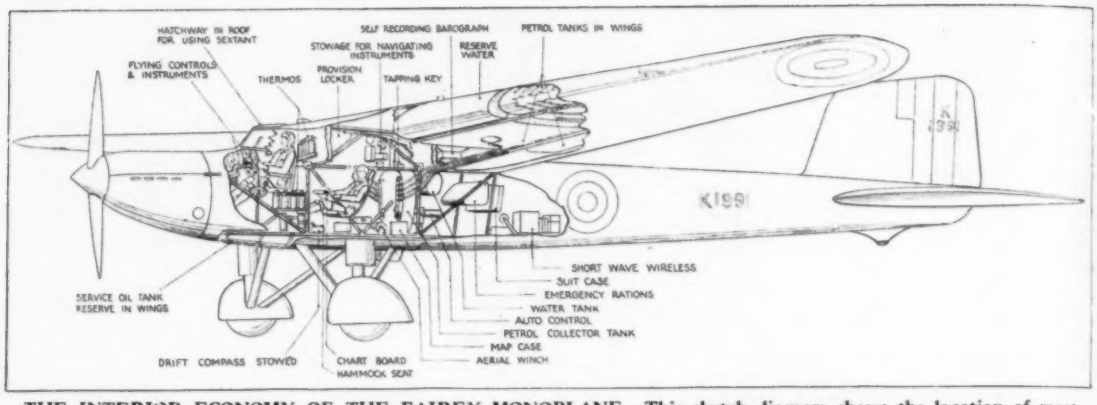
The Fairey ("Napier") monoplane was doped with Cellon, which appears to have protected the wing and fuselage fabric against weather and kept it taut in the most satisfactory manner.

In the structure of the machine certain highly-stressed tubes are used, and the Reynolds Tube Co., Ltd., made special arrangements to produce thin-walled high-tensile nickel-chrome tubes to fulfil these conditions.

Certain rubber parts and components, for example, in the undercarriage legs and elsewhere, were supplied by the Avon Rubber Co., Ltd., and Geo. Spencer Moulton & Co., Ltd.

From a winter's morning in England to the weather conditions in French Equatorial Africa a very large range of temperatures are likely to be met with, and the question of engine cooling thus became one of importance. The Serck Radiator Co., Ltd., may be content with its share in keeping the Napier "Lion" running perfectly throughout the flight.

Granted mechanical perfection of aircraft and engine, the success of the long-distance flight became very largely dependent upon the navigational and other instruments.



THE INTERIOR ECONOMY OF THE FAIREY MONOPLANE : This sketch diagram shows the location of most of the accessories before, during, and after the fact.

Reference has already been made to the automatic pilot, but it is worth pointing out here that whatever was the cause of the ultimate breakdown (and very likely it will be found to be a trivial thing), the "robot" did at any rate function satisfactorily for 27 hr., which is in itself a very remarkable achievement. When the "robot" failed, the crew still had their P.4 and 0.5 aperiodic compasses, while the R.A.E. sextant, Mark VIII, enabled Nicholetts to take star sights. In the clouds and dust storms encountered, the Reid & Sigrist turn indicator must have been an invaluable aid in complementing the compasses.

That the Napier "Lion" ran perfectly throughout and that its consumption worked out almost exactly as calculated can be ascribed largely to the quality of the "Shell" spirit used.

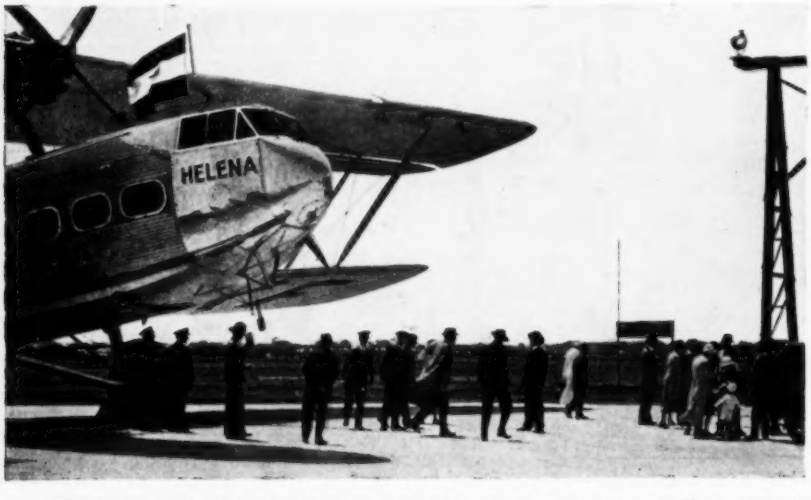
SIR E. GEDDES ON IMPERIAL AIRWAYS' FUTURE

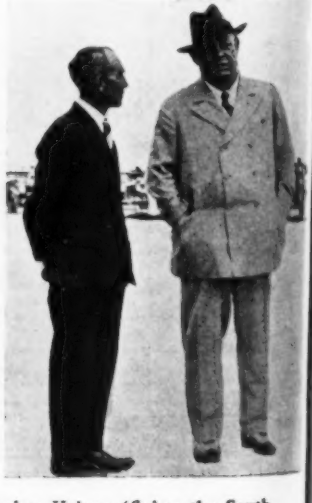
On Monday morning, February 13, Sir Eric Geddes, Chairman of Imperial Airways, and Mr. Woods Humphery, Managing Director, arrived back at Southampton from South Africa, where Sir Eric had flown from Brindisi. The journey down Africa was made in one of the Handley Page 42 machines, but the return trip was made by Union Castle liner. The travellers were met at Southampton by the *Heracles*, and while flying back to Croydon Sir Eric gave an interview to the Press.

He said that in the summer or autumn of the present year he hoped that the present Eastern service would be extended to Australia. On the African service the "Atalanta" type machines would soon be in use. From Cairo to Kenya Handley Page 42 type machines would be put into service, and south of that the "Atalantas" would be used. He hoped that the schedule to the Cape would be reduced to nine days in the near future, and they were aiming at making the journey in a week. "At present," said Sir Eric, "we are limited in our day's run by the amount of flying the passenger can stand. Soon, with more luxurious planes, we shall be able to fly from dawn to dusk." Sir Eric also spoke of the comparison with "record breakers," and said that when a record breaker started it was a case of "Perhaps he will get there and perhaps he won't." There could be no "perhaps" with Imperial Airways.

Sir Eric also said that they hoped, as soon as possible, to link up the Indian service with an extension to Bangkok, Hong Kong, Shanghai, and later to Tokyo. He also hazarded the prophecy that in the next two or three years they would be starting a regular British air service across the Atlantic.

On the flight down to Cape Town, Sir Eric said that the greatest interest was awakened at all stopping places by the appearance of the Handley Page 42, which was the largest aeroplane ever seen in Central Africa.





SIR ERIC GEDDES AT CAPE TOWN : H.E. the Governor-General (in overcoat) leaving *Helena* (flying the South African flag) after a flight over Cape Town. (Right) Maj. A. M. Miller, of Union Airways, chats with Sir Eric Geddes (of Imperial Airways) at Cape Town.

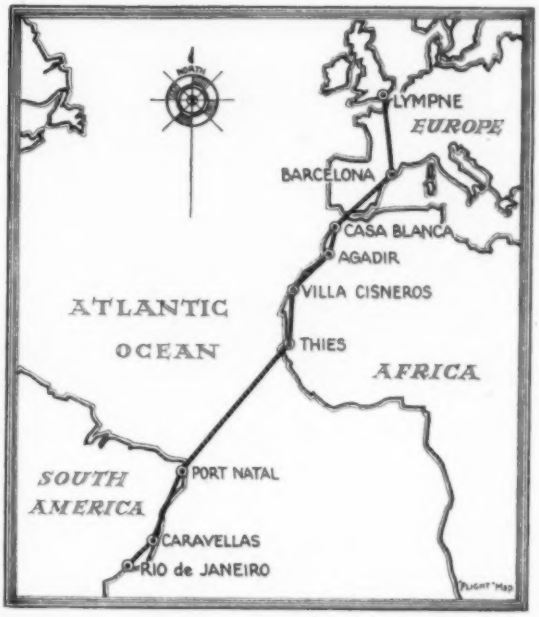
ENGLAND TO SOUTH AMERICA

MR. J. A. MOLLISON left Lympne at 8.12 a.m. on Monday morning, February 6, on an attempt to fly to South America in record time. He reached Port Natal, Brazil, at 6.20 on the evening of Wednesday, February 8, thus completing a journey of 4,600 miles in 3 days 10 hr. Mr. Mollison (as was reported in FLIGHT last week) landed at Barcelona at 5.10 p.m. and left again at 9 p.m. for Cape Juby; he landed at Agadir in Morocco, left two hours later, and landed at Villa Cisneros at 3.15 p.m.

At 8 a.m. on Wednesday, February 8, he landed at Thies, in French West Africa, and left that place at 12.50 a.m. on the morning of Thursday, February 9, for the 2,000-mile flight across the South Atlantic. So that during the 3½ days of the flight Mr. Mollison had only 23 hours in which to refresh himself and attend to his engine and machine. From a point of view of physical endurance all praise is due to the pilot for his feat, and his navigation must have been carefully worked out and rarely at fault, for which he probably owes much to Smith's instruments, Huson's compass and the Reid & Sigrist turn-indicator. Those who are interested in "records" can note that Mr. Mollison is the first person to fly from England to South America, the first person to fly solo across both the North and South Atlantic, the first person to fly solo across the South Atlantic from east to west, and finally he has flown across the South Atlantic in the record time of 17 hr. 40 min.

Mr. Mollison, on his arrival at Port Natal, in Brazil, was welcomed by the British Vice-Consul, a host of civil and State officials, and a crowd of citizens. On the morning of Saturday, February 11 he continued his journey to Rio de Janeiro and landed there about noon escorted by military aircraft.

Mr. Mollison was flying his D.H. "Puss Moth" *Heart's Content*, fitted with a 130-h.p. "Gipsy Major" engine, which was run throughout the flight on Shell Spirit and Castrol oil. Although the chief praise must be given to the engine, it must not be forgotten that the aircraft itself must have been subjected to considerable strain on such a long and arduous flight, and praise must also be awarded to such people as Reynolds, who contributed towards the actual airframe construction; also in this connection it may be mentioned that the machine was doped with Titanine, and had not been redoped since the trip across the North Atlantic. Neither should it be forgotten that beside the actual designers of the engine many other makers of component parts, such as the Weyburn Engineering Co., K.L.G., and B.T.H., contributed towards the efficiency of the whole power unit.



Sketch map showing the route followed by Mr. J. A. Mollison.

However much one deprecates what may be termed "stunt flights," nevertheless such a flight as this does have its utility. It adds further proof of British supremacy in aero engine design and airframe construction, and it proves that air journeys across large expanses of ocean are not as impossible as might have appeared a few years back. Last week it was suggested in FLIGHT that Mr. Mollison should not proceed home at once, but should do an aerial tour of South America, demonstrating his machine. It is now stated that such is his intention. Mrs. Mollison intends to pack up her machine and proceed with it by boat to join her husband.

Lord Wakefield is reported to have once told Mrs. Mollison that, were she but male in sex, he would gladly give her a job as salesman; so perhaps between them Mr. and Mrs. Mollison will be able to do some business, in which case FLIGHT, who on the whole deprecates Atlantic flights, will readily admit that this particular one was not undertaken in vain. South America contains many countries, the peoples of which are very partial to British-made goods, but it is necessary that really serious attempts be made to demonstrate the superiority of British aircraft. When representatives visit this country from such countries as Brazil and Argentine, we do everything possible to show them our goods, but it is no use waiting for people to come and buy your goods; you must go out and sell them, convincing people that though the price of British goods may be a little greater than the same goods from other countries, yet the little extra cost is compensated by the better workmanship creating greater reliability.

Mr. Mollison has now achieved most of the long distance flights attempted from this country; his name was first brought before the public eye by the flight from Australia to England in

THE HEART OF THE *Heart's Content*: Mr. and Mrs. J. A. Mollison have a final look at the "Gipsy Major" engine, just before "Jim" left for Lympne. (FLIGHT *Photo.*)

TWICE ACROSS THE ATLANTIC : Mr. Mollison's de Havilland " Puss Moth " *Heart's Content* **which has now crossed both the North and South Atlantic.** (FLIGHT *Photo.*)

8 days 19 hr. in July, 1931. In November of the same year he attempted to beat the record to Capetown, but after flying non-stop to Rome was unfortunate enough to crash 150 miles from Cairo. In March, 1932, he had a second attempt, this time successful, for he reached Capetown in 4 days 17 hr. Then in August, 1932, he flew across the North Atlantic from Ireland to Nova Scotia in 24 hr. On all these flights Mr. Mollison has used British aircraft powered by British engines and run on British oil and petrol.

Book Reviews

"Beauty of Flight." *By Dr. Manfred Curry (John Miles, Ltd., Amen Corner). Obtainable from* FLIGHT *Office. Price 15s. 9d., post free.*

AS Mr. Fairey states in his preface, Dr. Curry has the eye of a poet, but like poets he seems to be an idealist, for he has not hesitated to utilise the material devices of modern photography to idealise his subjects. That the results are beautiful is beyond a shadow of doubt, but that the photographs are a natural representation of the subject is open to question. However, the book contains a collection of very beautiful pictures and of exceedingly interesting subjects, which should certainly encourage those who fly to explore the ever-changing beauties of ethereal regions. The book also proves that there is art in photography, as there is in music and painting, for although the photographer may have more mechanical devices at his command than does the painter, yet these would be useless and only produce the grotesque if the brain behind were not ruled by the temperament of a true artist.

"Death in the Air." *(William Heinemann.) Obtainable from* FLIGHT *Office. Price 9s., post free.*

IT is understood that the writer of this Diary was killed in action during the last year of the war, which is perhaps just as well for his peace of mind. He looked forward to an Arcadian post-war England, and would have been, like many others actually were, sadly disappointed. His philosophy of war is interesting and candid. At heart he was an idealist, but sank his idealism the better to do his material duty. The diary gives a good impression of a pilot's life during the war, and judging by the realistic atmosphere created, appears genuine enough. Whether the accompanying photographs are genuine or not is debatable and matters little. Even if they are the latter, they are good " fakes " and worthy of interest, whilst they provide admirable illustrations for the text. The foreword states that no attempt has been made to change or improve the phraseology or grammar in the type-written manuscript, which is a pity, for the monotonous repetition of certain adjectives leaves anything but a pleasant taste in the mouth of a normally sensitive reader, and could easily have been omitted without in the slightest degree detracting from the reality of the atmosphere created. The supposition or superstition that pilots during the war were a hard-swearing, hard-drinking collection of men, has been in the past put before the public quite enough and needs no further emphasis, and is inclined to react unfairly on the present-day pilots, particularly those of the Royal Air Force. In one case a noun of such a nature is used that one would be pleased to know it had been accidentally overlooked by either the publishers or the censors.

" Death in the Air " is nevertheless quite the best book of its kind that has been produced for some time, the sentiment expressed not being sloppy and the horror of certain scenes not made unduly lurid.

Cheer Up

DEPRESSION is a very catching disease and one which can best be combated by refusing to allow it to get you down, possibly helped by a knowledge that things are not so bad as they are generally supposed to be. Like all other trades, aviation has suffered and many people now think that the only aircraft constructors in a happy position are the chosen few building the aircraft of the moment for use in the R.A.F. That is, however, not quite true, and to help combat this depression we are offering the following cheering information for those connected with the industry.

At least three firms building civil aircraft are almost inundated with orders and are working night shifts to cope with the business. (We hope that there are more of whom we have not heard.) One we spoke to recently had solid inquiries for their machines from no less than 20 different countries. Another, who had appointed an agent in France as recently as two months ago, had already received orders for four machines from that country. Yet another has found the demand for their latest type far greater than they expected, with the result that they have had to reorganise their production department for this machine.

Apart from machines, operating companies seem to be greatly on the increase, not only in the east and west, but also in the north, so that before long we may expect to hear many new seasonal routes announced which will cater for the holiday traffic between this country and many pleasure resorts which are at present served only by boat or rail.

BERT HINKLER—A MEMOIR

A Very Great Pilot

LOATH to believe the worst until the very latest moment, FLIGHT has hitherto refrained from paying a tribute to the memory of Bert Hinkler. The postponement of the memorial service which had been arranged aroused once more the hope that he might be alive in some remote cottage in the Alps and unable to communicate with civilisation. But some time has passed since then, and the rumour remained unconfirmed from Swiss sources. No reasonable hope can now be entertained that he is still alive, and it would seem graceless to defer any longer the tribute of words from his friends on the staff of FLIGHT.

It has often been the sad duty of this staff to write obituary notices on gallant pilots who have given their lives to the cause of flying. Seldom has this melancholy duty been so mingled with a sense of personal bereavement. Bert Hinkler has been a personal friend of all the senior members of this staff ever since he first burst into fame in 1920 by his non-stop flight in an Avro "Baby" from London to Turin. The writer of this memoir first met him in the offices of A. V. Roe & Co., Ltd., shortly after he had bought the "Baby" and was discussing his flight. As usual, he insisted on no publicity before he started. His maxim always was "Do the thing first and talk about it afterwards"—but he usually forgot to do the subsequent talking. At that first meeting he insisted on being called "Bert." His Christian names were Herbert John Louis, but he did his best to forget them. Perhaps his most notable personal characteristic was his complete freedom from any form of conceit. He did not underrate his abilities as a pilot; he knew he was a good one: but his head was never swelled by his successes, and he seemed to prefer friends who did not attempt any adulation because of his great feats but who liked him for himself as a man. He was always the same, always a charming companion, with a very pretty turn of dry humour and very quick at the up-take. His smartness in repartee was evidence of how quickly his brain worked, and this was also evident when he had to deal with an emergency in the air. Once at a Lympne meeting a thick mist lay over all the course, but Hinkler in a little Avro monoplane kept lapping round and round. The noise of a little engine would be heard approaching the turning point and a ghostly white monoplane would appear right on the course, bank and turn round the almost invisible pylon, and disappear once more into the murk. When he landed I asked him how he had found his way round. He grinned—and when Bert grinned one felt that the world was not such a gloomy place after all—and said reflectively "I guess we have worn a track round the air by this time and the old bus just followed it." He won the endurance prize which he was after.

As a pilot it is hardly possible to rate Hinkler too high. Personal friends may be accused of bias if they give him first place among the pilots of the British Empire, but in sober fact his claim to that position can hardly be disputed. Pilots may perhaps be divided into four classes. The first class may be termed, for want of a better single word, aerobats. Closely connected with them come racing pilots. In a very different category are the test pilots. Finally there are the long-distance pilots. In the last three classes Hinkler certainly achieved first rank. Nothing corresponding to an international cap has ever been awarded to British pilots who have been picked to represent their country in a Schneider contest, but if there had been such a distinction, Hinkler was qualified to wear it. The Royal Aero Club chose him as a member of the 1925 Schneider team which went to Baltimore. He was not favoured by fortune there. After Biard had crashed in the Supermarine S.4, Hinkler was chosen to fly the second Gloster machine. He was obliged to attempt the navigability test on a rough day which was very unsuitable for racing seaplanes, and the floats of his machine gave way under stress of the waves. Hinkler was seldom lucky in the races for which he entered. He once won the Grosvenor Cup, but in the many King's Cup races in which he competed he never did better than third place in 1925. In calling him a racing pilot the allusion is to the Schneider team rather than to cross-country races like the King's Cup.

The work of a test pilot is of a very different character. The test pilot must have an analytical mind, and must be able to discover the causes of each idiosyncrasy in a new type of machine and be able to explain the matter to the designer. Hinkler was for years the test pilot of the Avro firm, and worked in the closest collaboration with Mr. Chadwick. In particular he tested the "Aldershot" with Napier 1,000-h.p. "Cub," and was the first British pilot to fly an aeroplane of such power. He also tested the "Crusader" seaplane which was entered for the 1927 Schneider. Hinkler was not only able to analyse each point about a new machine, but he was himself a gifted and most ingenious designer. The undercarriage which he designed for the "Avian" was adopted as standard, and was excellent. On his private machines he was always designing little improvements which he did not always trouble to patent. Finally he designed the "Ibis" amphibian to embody his ideas of what a machine for the air tourer ought to be. It perhaps goes without saying that Hinkler was also a very fine mechanic himself, and consequently very rarely had trouble with his engine on his long flights.

It is as a long-distance pilot that Hinkler will chiefly be remembered. Most of his great flights were made solo in small machines. The list of these flights is as follows. In 1920, Croydon to Turin non-stop, 700 miles in 9¼ hr. in Avro "Baby" with 9-h.p. "Green" engine. In 1921, Sydney to Bundaberg non-stop, in the "Baby," 800 miles in under 9 hr. In 1927, London to Riga, 1,200 miles non-stop in 11 hr., in Avro "Avian" with "Cirrus." Later in the same year, England to Eastern Galicia with McIntosh in the Fokker *Princess Xenia* (afterwards *The Spider*). In 1928, the great solo flight in his "Avian" from England to Australia in 16 days. In 1931, New York to Jamaica, non-stop, in a "Puss Moth," and from Brazil to Bathurst in Gambia across the South Atlantic.

As everyone knows, Hinkler was a Queenslander, and came from the little town of Bundaberg. In the war he served as a rating in the R.N.A.S., and was given the D.S.M., though he would never tell anyone why. After his flight to Riga he was given a Latvian decoration, which much pleased him. After the great Australian flight he was given the A.F.C. and was made an hon. squadron leader in the Royal Australian Air Force. He never used the title or bought the uniform.

The loss of Bert Hinkler is a very heavy one. We offer our deep condolences to Mrs. Hinkler, and assure her that we share her grief.

F. A. DE V. R.

READY TO GO OVER THE TOP : On the left, the Westland "Wallace" making a test flight, piloted by Mr. H. J. Penrose. On the right, Lt. Col. Blacker explains one of the Williamson pistol cameras to Flt. Lt. McIntyre (centre) and Sir Ernest Petter (right).

THE HOUSTON-EVEREST EXPEDITION

LAST week the Westland "Wallace," the second of the two machines which are to be used for the Houston-Westland Everest Expedition, was successfully tested at Yeovil. Piloted by Mr. H. J. Penrose, and with Lt. Col. L. V. S. Blacker as observer, the machine took off shortly before 11 a.m. on February 3, and was soon lost in low clouds. For several hours nothing more was seen or heard of the "Wallace," until, later in the afternoon, a message came through from Hamble stating that it had descended there.

It was stated that the "Wallace" had reached an altitude of 37,580 ft. (uncorrected) during the flight, which extended over Kent, thence along the coast line to Hamble. The lowest temperature was – 50 deg. C., and the machine was covered with frost when descending.

When the machine had reached 30,000 ft. the oxygen tube attached to Mr. Penrose's mask became disconnected, and he had to descend again to 5,000 ft. to put matters aright.

During the ascent, Sir Ernest Petter entertained members of the Expedition and officials of the Westland Aircraft Works at luncheon at Yeovil ; unfortunately, Mr. R. A. Bruce, Managing Director of Westlands, was unable to be present. Sir Ernest Petter proposed success to the Expedition and said his company was proud to have had the opportunity of preparing the machines for this Everest Expedition, and they had every confidence that they would fulfil requirements.

Air Commodore Fellowes, in reply, said that there were three factors on which success depended. The first was the gift of the funds by Lady Houston and her arrangements for the organisation of the Expedition, the second was the efficiency of the engine, and the third the efficiency of the aeroplane and its equipment. He thanked the Westland Aircraft Works and the Bristol Aircraft Company most warmly for the splendid efforts which they had put forth to produce the aircraft in so short a time so that the aeroplanes could be shipped to India on February 11.

The P.V.3 and the "Wallace" were duly crated and loaded on s.s. *Dalgoma* on February 9, and are expected to reach Karachi during the first week in March. Air Commodore Fellowes, Sqd. Ldr. Lord Clydesdale and Flt. Lt. McIntyre—the principal members of the Expedition—are expected to leave Heston to-day, February 16, in three machines, and fly "in formation" to India, accompanied by Mrs. Fellowes and the Special Correspondent of *The Times*. Air Commodore Fellowes will fly a "Puss Moth," Lord Clydesdale his "Tiger Moth" and Flt. Lt. McIntyre the "Fox Moth" belonging to the Expedition.

In conclusion it may be of interest to give the following notes relating to the cameras which have been supplied to the Expedition by the Williamson Mfg. Co., Ltd.

"Eagle" Type 3 cameras are used, fitted with special wide-angle Ross lenses of 5-in. focus. The picture size is 5 in. by 5 in. and full records are given with each exposure, of time, altitude, serial number and the usual written data. On account of the extreme cold which, even in the cockpit reaches — 40 deg. F., it has been found necessary to fit internal heaters and heating blankets. Heaters are fitted inside the camera body and cones. Each film magazine has its individual heater with special plugs and leads. These are thermostatically controlled to maintain an even temperature. Spare magazines are carried in compartments provided with electric connections for the magazine heaters. The importance of avoiding extreme cold in the film magazine will be appreciated when it is understood that celluloid at temperatures of — 20 deg. or lower becomes extremely brittle and breaks when bent. India-rubber and rubber fabrics such as are used in focal-plane shutters of some cameras suffer the same characteristics, but the all-metal "Louvre" shutter of the "Eagle III" is unaffected by low temperatures. In spite of this heating, which consumes 25 amperes per camera, heat dissipation is so rapid that it is anticipated that some parts of the camera will still be at temperatures approaching 32 deg. F., and, owing to the extremely high viscosity of the best of oils at this temperature, it has been found necessary to run the cameras for this flight practically devoid of any lubrication. It has been necessary to pay special attention to fits of bearings, etc., especially where metals with dissimilar contraction coefficients are interconnected. The optical system of the complete cameras has been carefully checked by the National Physical Laboratory, Teddington.

Hillman Developments

MR. EDWARD HILLMAN tells us that his negotiations with the authorities at Manchester have unfortunately definitely fallen, through. He is therefore turning his energies to other fields. He said he did not feel at liberty to tell us where these fields lay, but he admitted that we could draw our own conclusions from the fact that he was just off to Paris in one of his D.H. "Dragons" (two "Gipsy Majors").

An Air Ministry Retirement

MR. R. F. M. PEARSON, C.B.E., Deputy-Director of Works and Buildings at the Air Ministry, has retired after 34 years' service. He has been engaged on construction of docks at, among other places, Devonport, Jamaica and Portland. In 1914 he was with the Naval Mission to Greece under Admiral Mark Kerr, and was given the 4th Class of the Order of the Redeemer. His successor is Mr. H. A. Lewis-Dale, author of *Aviation and the Aerodrome*.

THE AMSTERDAM—BATAVIA WEEKLY SERVICE

By A. PLESMAN

(*Concluded from page* 133.)

Description of Material

I have already pointed out how the first experimental flights along the K.L.M. Indian route were carried out, from sheer necessity, indeed, with material which was really not quite suitable for the purpose. The first mail flight with a triple-engined machine gave much better results, as the Fokker F. VIIb machine of that time—I am speaking now of a period already five years behind us—might be called an exceptionally good machine. The numerous world flights made with this type of machine, its exceptionally good flying qualities and general practical serviceableness, made the choice for the K.L.M. not a difficult one. The great success of the F. VIIb machines over the whole world, a success by no means the least with the K.L.M., led other air transport companies to adopt the same type, and so we see many companies, even today, regularly using these machines and exploiting them with entire satisfaction. Five years is a long time; a very long time, indeed, for a new means of communication still in process of development. If a certain type of machine is operated during five years, it is a proof that it is very good, both from a technical and economic point of view.

When, on October 1, 1931, the fortnightly service was changed into a weekly one, it was originally flown with F. VIIb's and Fokker F. XII's alternately, but in April, 1932, the F. VIIb machines, becoming too small, were withdrawn from the service which was subsequently exclusively operated with F. XII machines. The K.L.M., however, did not rest there, and however excellent the qualities of the F. XII, urged upon the N.V. Nederlandsche Vliegtuigen Fabriek (Fokker) the necessity of developing a still speedier machine which must also be equipped with the same Pratt & Whitney "Wasp C." engines of 425 h.p., with which the F. XII had obtained such brilliant results. These machines, type F. XVIII, entered the service in the course of 1932. The K.L.M. has now five of this type of machine. The whole weekly service is operated with these five machines and with two F. XII machines, one of which is always held in reserve and revision, whilst in India a machine is always automatically in reserve, as normally each machine remains ten days at Bandoeng and the service is a weekly one.

The machine and the engines naturally form such an important factor in the exploitation that I must dwell somewhat longer on it. If we pass over the F. VIIb machines as being of merely historical importance—as far at least as the Indian route is concerned—then we see in March, 1931, thus before the beginning of the weekly service, the first departure of a F. XII for India. I participated in this flight as passenger in order to inspect the intermediate stations and to confer with our sister company, the Royal Netherlands Indian Air Lines. I was immediately struck with the amount of room afforded each passenger, the spacious cockpit which facilitated the work of the crew and the smooth running of the American air-cooled engines, specially suitable for service in all weather conditions, sand storms and monsoon rains, owing to the enclosed valve mechanism, the protection against rain of the carburettor heating, magneto covers and the adjustable crank case shutters, which make it possible to regulate the oil temperature to a certain extent. The first F. XII machines were not provided with Townend rings; the subsequent adoption of these rings proved a great success. Not only was it possible to attain a considerable saving of fuel with the same speed, but these rings proved to possess the additional advantage that they eliminated to a considerable degree the annoying disturbances in the wireless caused by the sparking plugs. This, however, is only an incidental advantage, and it should not be concluded that the screening can be completely done away with, as many of the other parts, more especially the magnetos themselves, can cause trouble.

After the first F. XII machines had been delivered by Fokker an inquiry was made, on the initiative of the K.L.M., but in collaboration with Fokker factory, into

COMFORT AND ROOMINESS: The cabin of the Fokker F.XII as equipped for the Amsterdam-Batavia route. The radio set is on the left of the door to the pilots' cockpit.

the question of how far it would be possible to increase considerably the loading capacity of the subsequent F. XII machines, on the one hand, by a higher total weight; on the other, by a lowering of the empty weight. These efforts were crowned with success. The empty weight was reduced by the use of electron for the petrol tanks and for the cowling. The carpentry work in the cabins was made considerably lighter and the heavy sash windows with handles and mechanism were replaced by sliding windows, by which it was also possible to eliminate the heavy ply-wood which shut off the window mechanism from outside. The steel cabin chairs were replaced by electron chairs. Although these chairs were much lighter, we were regretfully compelled again to replace them with steel furniture, as in the tropics they developed symptoms of corrosion. Chairs made of hydronalium constitute a point for consideration. As a very important step towards an improvement of the F. XII machine must be mentioned the use of bakelite ply-wood, which is the ideal material for the tropics, as it is in a high degree immune to the influence of water. Moreover, this material can be supplied in extremely thin plates of 0.6 to 0.8 mm., with the result that a considerable economy of weight can be achieved on the wing covering when this material is employed on the less stressed portions of the wing, for example, behind the rear spar. The suspension with Sandow rubber may also be regarded as obsolete. Rubber, indeed, is a very unsuitable material for use in the tropics. The most recent F. XII machines and the F. XVIII's are provided with Messier oleo-pneumatic landing gear struts.

To ensure regularity in operating the route, engines of great reliability are absolutely necessary. If the exploitation is to be favourable from an economic point of view, however, it is further necessary that the maintenance costs of the engines should not be too high. The modern American engines can easily make periods of 400 to 500 hr., but the K.L.M. wishes to take no risks on a long and difficult route like that to the Far East, and the Wasp engines after two round trips, *i.e.*, after 290 hr., are sent to the motor shop of the K.L.M. for an overhaul.

Ever since it was founded the K.L.M. has always taken aeroplane and motor repair work in hand itself and even carried out important repairs and reconstruction of its machines in its own workshops at Waalhaven. This policy has proved the correct one and the cheapest, whilst in cases where urgency is necessary, the time otherwise necessary for transport to the factory, for dismantling the machine and mounting it again, is saved.

The aeroplanes now in use require much less maintenance than those with which the K.L.M. began operations in 1921. The experience accumulated during twelve years of air transport has been utilised in the construction of the F XVIII machines, thanks to a close co-operation between the K.L.M. and the aeroplane factory. Where formerly, for example, seven years ago, a machine could only reach 500 flying hr. in one year at the cost of great efforts and much work, various machines can now, in 1932, attain 1,000 flying hr. This result is due in the first place to the fact that the period between two revisions has been increased from between 250 and 500 hr. to between 1,800 and 2,500 hr., with a slight overhaul after the first 1,000 hr.

The starting of the "Wasp" engines was originally made with Eclipse energy starters, which were made to revolve by hand with the help of a handlle. Although the starter as such proved efficient, the work of turning it in the tropics demanded so much effort on the part of the crew that it proved desirable to replace these starters by others. The choice of the K.L.M. fell on the starting pistons which had given such satisfaction to the K.L.M. when used with the "Jupiter" and "Titan" engines.

From the British side, this method of starting the engine has been subjected to some criticism, and with reference to this I would just say that this system of starting up the engines has been employed by the K.L.M. tens of thousands of times without any detrimental influence becoming apparent on the cylinder or on the main connecting rods or pistons.

Tail-wheels are now fitted to all F.XII and F.XVIII machines. At first a few pilots entertained a certain prejudice against these, as they had too little confidence in the wheel brakes. When these showed themselves quite reliable, however, and the capacity to manœuvre proved much greater, the tail-wheels constituted a great improvement.

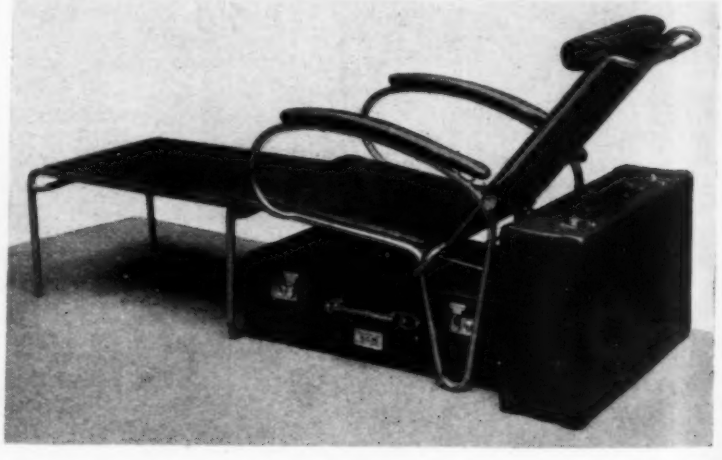
Extensive experiments were made with wheel fairings, but although to the eye the shape appeared very favourable from an aerodynamic point of view, the increase in speed was only 1 to 2 km. an hour. Moreover, wheel fairings are very unpractical, easily damaged and in certain circumstances even dangerous. When it further finally appeared that they were absolutely useless on muddy ground, they were definitely given up.

Trouble was experienced in dust storms with exterior steering cables. The rudders became sluggish in movement, and continual cleansing brought only temporary improvement. With the F.XVIII machines, this difficulty was eliminated by leading all the control cables inside the body. This renders the possibility of inspection somewhat more complicated. In the ceiling of the cabin, hatches have been made for the inspection of the control cables.

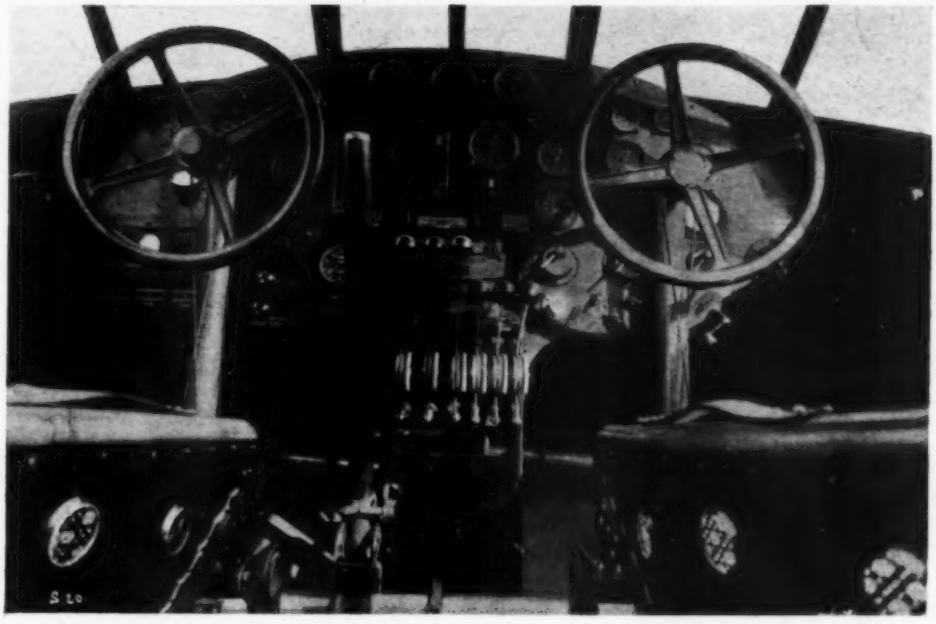
The body of the F.XVIII is narrower than that of the F.XII and rounded on the top.

All machines for the Indian route are provided with two gyroscopic turn indicators, one German "Askania" and one French "Badin Pioneer," the latter being combined with an airspeed indicator. All machines are further provided with longitudinal inclinometer and a climbing speed gauge. Experiments were also made with Sperry artificial horizon and a Sperry direction gyro. The general adoption of the Sperry horizon is one of the last improvements destined to facilitate blind flying. For the rest, blind flying with the F.XVIII machines is not exacting, as the inherent stability of the machine is very great.

All machines are equipped with fixed antennæ, which constitutes a double advantage: First, the wireless can be used when the machine is flying very low or is standing on the ground; and, secondly, the chance of being struck by lightning is much less than with the use of the trailing antennæ. This latter danger is a point which is still being studied. A protective device is still in course of being tested. Attention is being given to the problem of the drawing off of static electricity and several parts of the machine have an extra earthing or are at least extra electrically connected with the main construction of the body, more especially with the engines, as it has appeared that the drawing off of static electricity can very well take place via the sharp and rapidly rotating propeller blades.



DOING LONG STAGES IN COMFORT: The type of chair used in the Amsterdam-Batavia machines. Passengers' suitcases stow away neatly within easy reach.



"THE OFFICE": Pilots' cockpit in the Fokker F.XII.

The use of cylinder temperature indicators is perhaps of sufficient interest to justify a few remarks. These very useful instruments are not only of importance when the machine is in an experimental stage; they give also a timely warning against overheating and where this eventually may be due to the use of less suitable fuel, it also constitutes on the Indian route a control instrument as regards the quality of the petrol supplied.

The Fokker F. XVIII, flying fully loaded (7,550 kg.) on any combination of two engines, has a service ceiling of 1,700 metres. Under the term service ceiling is meant the altitude at which the climbing speed still amounts to ½ m. per sec.

The K.L.M. was one of the first air transport companies to use metal propellers. Originally, these were Reed propellers, but later we gave the preference to adjustable pitch Standard steel propellers. We are convinced that with the prevailing weather conditions on the Amsterdam-Batavia route, *i.e.*, heavy rains in the tropics and hail-storms in Europe, only metal propellers can stand the strain with the actual 1,700 to 1,750 r.p.m.

The influence of the tropical sun and the fact that the machines had very often to spend the night in the open air, exercised at first a detrimental effect on the paint work, especially on the varnish of the wings. A very considerable improvement was obtained, however, by using aluminium-coloured nitro-varnish and aluminium valspar lacquer for the older machines, both of which can be applied with the paint-spray pistol.

Finally, just a word concerning the equipment on board and at the intermediate stations. In order to be able to carry the largest possible load, we have restricted to the greatest possible extent the number of reserve parts, tools, and articles of equipment on board. These still form a respectable quantity, however, because it is necessary to have on board articles of equipment which do not lend themselves to being kept in stock at the stations owing to the fact that they may be needed in the air or at stations where no tool chests are present. In total we have about 200 kg. on board, including, however, ten large thermos flasks containing 20 kg. emergency rations and a stock of tinned food for use during the journey. With a view to unexpected forced landings in the desert or in the tropical forest, we have, in addition to the emergency rations, also tins with drinking water (25 to 30 l.) on board and also a distilling machine to render dirty water suitable for drinking. Also with a view to forced landings en route, the machines are provided with mosquito curtains to be used over night in or outside the machine. Of course, there is also a medicine chest with instructions for use and a very complete chest with wound-dressing requisites.

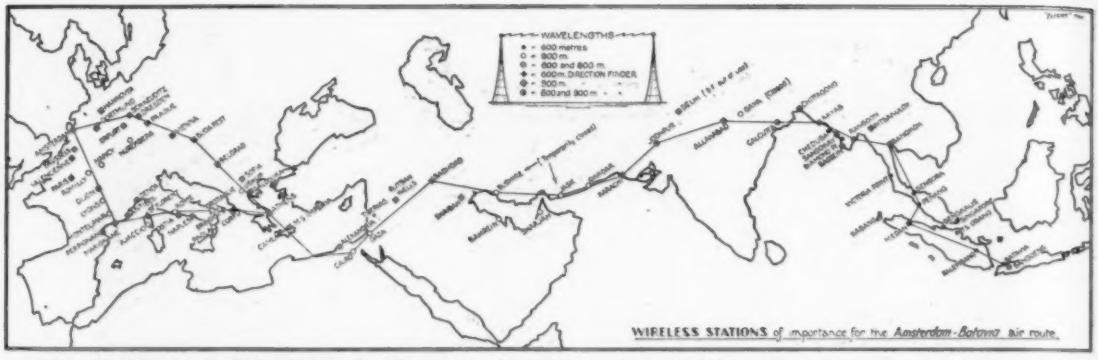
At the chief stations, Cairo, Baghdad, Karachi and Bangkok, we have deposited extra supplies, in addition to the usual station chests distributed over the 22 stations along the route. Moreover, we have at several stations our step-ladders, our filling material, carts, grease squirt installations, and larger reserve parts, such as motor cylinders, propellers, wheels and tyres.

Wireless

On the test flights and during the first period of the regular service, the route Amsterdam-Batavia was flown without wireless. The chief reason for this was that at that time a wireless installation would only have been of use on the European section of the route, as farther on the necessary ground stations were practically non-existent. When experiments were made, it was immediately demonstrated that, although we had become accustomed in Europe to the advantages of wireless *under certain circumstances* (in unfavourable weather and for safeguarding a few short sea stages, such as the crossing of the Channel), this expedient on the Indian route was of great value *under all circumstances*. These experiments were undertaken, owing to the establishment of British wireless stations on those sections of the route where sand storms and monsoon rains made them most necessary.

Practically speaking, in the series of wireless ground stations between Amsterdam and Batavia, lacunæ no longer exist, which means that the machines are almost always in touch with two stations, one in front and one behind. In some countries, it is true, the personnel at the stations show some shortcomings as regards the routine in working with aeroplanes, but also this part of the wireless organisation is improving every day. Generally speaking, it can be said that the average working sphere of the wireless installations used on board the K.L.M. machines amounts to 300 km., whilst communications over distances of 800 km. are by no means exceptional.

Once it was decided to introduce wireless on the Indian machines an effort was made for a time not to increase the original crew, consisting of two pilots and one mechanic, but to charge the second pilot with the wireless service. It appeared, however, that these second pilots, although they had passed the required examination, did not possess the practical experience necessary to correspond fluently in difficult circumstances. The greatest objection, however, was that just when wireless assistance was most



GUIDING THE AIR TRAVELLERS: The chain of wireless stations of which good use is made on the Amsterdam-Batavia air route.

necessary, that is, in bad weather, the presence of both pilots in the cockpit was desirable. At the present time a professional wireless operator (detached by the K.L.M. from the Corps of Wireless Operators of the Mercantile Marine) forms a permanent member of the crew.

In air traffic an important section of wireless work consists of direction finding for navigational purposes. On the Indian line the K.L.M.—with the exception of one experiment with a direction-finder on board—from the very beginning followed the system adopted in Europe of bearings from the ground stations. This was possible owing to the fact that the British also followed this system and had equipped a large number of their ground stations with direction-finders.

Navigation

The navigation on the Amsterdam-Batavia route is in principle identical with that on the European lines. The only difference is that the factor of dead reckoning plays a greater *rôle*, owing to the greater distances, less diversity in the nature of the ground surface of many regions (sea stages, deserts, extensive plains in India, tropical forests) and also owing to the less elaborate maps. Wind correcrections, therefore, play here a more important *rôle*, for which reason the K.L.M. machines on this route are equipped with a special and extremely simple arrangement for drift measuring. This arrangement consists of nothing more than a round hole covered with glass in the floor between the two pilots' seats and within which a ring, provided with two threads running parallel with the length of the machine, can revolve. By means of a handle each of the pilots, from his seat, can so manipulate this ring that fixed points on the ground or the tops of waves, pass precisely along these threads. An indicator fastened to the axis then gives the number of degrees of drift to starboard or port. The method of measurement applied by the K.L.M. pilots with the help of this simple instrument, the effect of which is that the influence of side wind on the *course* followed is completely compensated, but whereby some uncertainty with regard to the *ground speed* remains, proves in practice absolutely sufficient, with sea crossings of 400 km. and desert stages of still greater dimensions, to guarantee arriving accurately at the destination desired and that notwithstanding winds which repeatedly change in direction and velocity.

During navigation in or above the clouds, whereby for one's dead reckoning no side wind corrections can be applied, the wireless direction-finding stations at the places of destination naturally play a great *rôle*.

Weather Conditions

Weather conditions influencing the safety or the regularity of the Amsterdam-Batavia service are as follows:—

(1) *Fog and low-lying clouds above hilly or mountainous country, with the consequent danger of ice formation.* Practically, this applies only to the European section of the route (between Amsterdam and Crete) and then specially in the autumn and winter.

(2) *Sand storms,* or to put it more correctly "dust storms," which during the spring and summer occur between Rutbah Wells and Jodhpur. These can reach a height of more than 2,000 m. (6,000 ft.), and reduce visibility to 30 m. (30 yd.). When such a storm is raging at the place of destination, landing is impossible with technique as it stands to-day, even with the help of wireless guiding.

(3) *Monsoon rains and tropical thunderstorms,* which occur in the summer and autumn between Karachi and Batavia, but which, generally speaking, are only regarded as serious between Allahabad and Penang.

The above sequence also applies to the degree of hindrance caused by these factors on the Amsterdam-Batavia service. Worthy of note is the fact that, of the three factors mentioned above, the monsoon rains were originally the most feared, but experience has proved that they have the least influence on the regularity of the service. It is true that on one or two occasions exceptionally severe monsoon rains have placed a K.L.M. machine in a dangerous situation, but have comparatively seldom caused delays of any importance, such as are sometimes caused by sand storms or mist. In the few cases where monsoon rains caused serious delay, this was due not to difficulties experienced in flight—flying, indeed, was quite possible—but to the fact that it was impossible to land on the aerodromes, which were flooded.

One thing in favour of maintaining, as far as possible, a uniform duration of the journey throughout the various seasons of the year is that the three obstructive factors, fog in Europe, sand storms in the Middle East and monsoon rains in the Far East, practically follow each other and seldom coincide. If a travel scheme is thus drawn up with a small margin—one day, for example—in the theoretically necessary number of flying days, there is a considerable chance that time lost by reason of one of these three factors can be recovered on another section of the route.

Meteorological Reports

The organisation of the meteorological service on the Indian route on behalf of air navigation cannot be compared with what has been achieved in this sphere in Europe, but even here it is possible to notice an improvement. It is naturally extremely difficult, in this special branch of meteorology, to organise co-operation between so many countries where applied meteorology is in itself so little developed. The international air traffic ought to be grateful for the excellent work performed in this sphere by the British R.A.F. wherever its squadrons are stationed and for the broad-minded spirit with which it makes its observations and forecasts available by means of its own wireless stations.

One class of data which, outside of Europe, are still much too uncommon, are those of wind velocities at various altitudes, of such enormous importance for favourable navigation.

In British India a meteorological service for air traffic is being conscientiously developed. It is true that much has still to be done, and lack of the necessary funds make complete achievement improbable in the near future, but the K.L.M. has great admiration for what, with extremely scanty means, has already been accomplished in that country and for the very active interest shown in aeronautics by British-Indian meteorologists.

Aerodromes

The aerodromes situated along the route Amsterdam-Batavia are generally not smaller than those in Europe,

but here, relatively speaking, *larger* grounds are necessary. By this is meant that, owing to the unfavourable condition of the ground, heavy rainfall and other circumstances, the whole surface of the aerodrome frequently cannot be used by heavy machines. The landing grounds also are sometimes encircled with obstacles which on a busy European aerodrome would not be tolerated. The chief reason, however, why in the tropics relatively larger aerodromes are necessary than in Europe, lies in the greatly reduced starting capacity of aeroplanes in hot weather, more especially when it is accompanied—as it very frequently is—by absolute calm.

Outside Europe ground lighting—apart from what is improvised—is only found at Baghdad and Karachi. Sheds, able to accommodate a K.L.M. machine, are—outside of Europe—available at Gaza, Baghdad, Karachi, Calcutta, Rangoon, Medan, Batavia and Bandoeng. At Jodhpur such a shed is in course of construction.

Petrol-filling installations, *i.e.*, hand pumps, are now available on all important aerodromes, and the average time spent in tanking is only 45 min.

Personnel

As already stated, the K.L.M. machines on the Amsterdam-Batavia route have at the present time a crew of four, viz., a first pilot (commander), a second pilot (also charged with the administrative work on board and with the care of the mail), a mechanic (who during the flight must also perform some simple steward's work) and a wireless operator who, on the night stops, must also assist the mechanic in daily work of keeping machine and engines in good condition.

Little can be said about the training of the wireless operators, as the K.L.M. takes these over, already trained, from the mercantile marine. All that is necessary to make these operators suitable for their work with the K.L.M. is to explain to them the nature of the work they will be required to perform.

The board engineers are selected from the most competent of the personnel in the workshops of the K.L.M. A long training is necessary before these can be charged with this responsible and self-reliant function.

It has appeared that more cases of sickness occur among the board engineers on the Indian route than among the other flying personnel. The reason for this will partly lie in the more comprehensive nature of their work and partly in the circumstance that the medical examination is less exigent.

The training of the aviators destined to serve, in the first place as second pilot and probably later on as commander, on the Indian line is naturally of the greatest importance. It goes without saying, in view of the multiplex nature of the task of the pilots on the grand trunk lines of the air, that this training must answer the highest requirements. In addition to first-class flying ability and a thorough knowledge of technique and navigation, they must also possess administrative and commercial insight, a knowledge of languages, tact in intercourse with passengers and with all sorts and conditions of personnel at the various stations, and in, last but not least, maintaining the necessary sense of discipline on board. All this means a combination of requirements which, in their many-sidedness, are certainly not less than those demanded of the most highly trained ships' officers. It is remarkable how the commanders at present available, and who really were not trained along these lines, accommodate themselves generally in masterly fashion to their task, from which it appears—whatever may be said about training—that what matters first and foremost is character, aptitude and practice. The pilots now serving with the K.L.M. were drawn, without exception, from the flying services of the Navy and the Army, in which they had risen to the rank of officer or non-commissioned officer. In the present transition period, during which, at the same time, the pioneer work on the Indian line must be carried out—during a period, therefore, when the highest requirements are demanded of the flying personnel, it was the task of the K.L.M. to transform these military aviators into suitable officers for world-air traffic. More and more, however, the conviction is gaining ground that the training ought to be made more systematic and on the lines as required for other means of communication. Last year an experiment was begun on a small scale with a number of pupils of the Naval Institute at Amsterdam, who, in addition to their course of instruction for mate's certificate, follow a complete course of instructions for civil air pilot. Naturally, it is not yet possible to give the results of this experiment. In addition to passing through a three years' course at the high school and a two years' course at a secondary technical school, a complete course of training for officer in the mercantile marine coinciding with training for air pilot, is considered desirable. An appointment as second pilot with the K.L.M. can then follow, in which function the further necessary training can be completed.

Health and Hygiene

One of the reasons which contributed to the adoption of the principle that the same crew should carry out the journey from terminus to terminus, was the consideration that this system was favourable to the health of the crew, and experience has shown that the rapid transit through various climates, followed finally by a long rest in a favourable climate like that of Netherland and that of the hill station of Bandoeng in Java, exercises the least unfavourable influence on the constitution of the crew. The most common ailments experienced *en route* are intestinal trouble, abnormal heat with the danger of sunstroke and heatstroke, malaria, and finally, as long as the degree of comfort is still limited, general fatigue, which—as long as the crew remains so small—can be accompanied by moral fatigue. As the crews are innoculated against typhus and cholera these diseases constitute no real danger. Lately, innoculations also take place against dysentery. With regard to fatigue, a considerable improvement is achieved by better means of navigation, more opportunity of moving about in the aeroplane and the easier handling of the machine, although, naturally, flying in unfavourable weather conditions, such as fog in Europe with the danger of ice formation on the machine, sand storms, monsoon rains, heavy thunderstorms and gales, still demand an exceptionally heavy physical and moral strain.

Against sunstroke the crews protect themselves in the first place by wearing special spectacles with Crooks or Zeiss glasses, which absorb the chemically working light rays (50 or 75 per cent.). Pith helmets are worn against the heat.

Although cases of sickness have occurred *en route*, the number of delays caused—even slight ones—is extremely small.

Results Achieved

Regularity.—The degree of regularity attained is shown by the accompanying graphics.

TRAFFIC IN 1932

	Kg.
Mail, east-bound	14,069
,, west-bound	14,435
Total	28,504
Passengers, east-bound	215
,, west-bound	231
Total	446

(Passengers on intermediate stretches included.)

	Kg.
Freight, east-bound	2,385
,, west-bound	3,100
Total	5,485

AVERAGE REVENUE PER PRODUCED TON/KM.

	D. fl.
From mail transport	2,420
,, passenger transport	0,184
,, transport of extra luggage	0,007
,, freight transport	0,023
Total	2,634

COST PRICE PER PRODUCED TON/KM.: D. fl. 2,37 (inclusive of depreciation insurance and all overhead expenses of the Amsterdam–Batavia route).

Commercial Ground Organisation

The K.L.M. has no personnel of its own stationed along the route. The agents charged with the promotion of its interests are selected according to the following method. In those countries where local air traffic already existed, these air companies, when such was feasible, were charged with the representation. In this way co-operation originated with the Imperial Airways in Egypt and Iraq, with Junkers Luftverkehr in Persia, and with various air companies in Europe, whilst in Netherlands India, Royal Netherland Indian Airways (K.N.I.L.M.), the sister company of the K.L.M. which operates air traffic in India, was appointed head agent for the whole of the Far East. In our East Indian Archipelago, this company has supported admirably the work of the K.L.M.

Organisation of Passenger and Goods Traffic

The considerations which led to the adoption of the principle of mixed transport have already been mentioned. As regards passenger traffic, the K.L.M. took the point of view that the daily stages flown ought to be as long as possible, with at most two intermediate landings and a final stop in places which guaranteed sufficient comfort for travellers and crew. The division of the daily stages as these are to-day was made with this object in view. At the same time, the K.L.M. made arrangements with hotels and rest-houses along the route, according to which passengers obtain food and lodging without paying for it. Later, the account is settled with the K.L.M., through the agents, at fixed prices. The result is, thus, that the traveller's hotel expenses are included in the price of his ticket and he does not need to worry about money exchange rates.

Customs and Other Formalities

The formalities required by the Customs are by no means slight. At nearly all ports they demand a manifest for goods discharged, one for goods taken on board and three for transit goods. Special permits are necessary for transit of gold in Persia and permission must be asked anew on each occasion. Iraq has a transit duty of 1/10th per cent. *ad valorem*, which must be regarded as very prohibitive, especially where it concerns the transit of gold, and in all cases makes the transport of valuable goods almost impossible. Formerly this transit duty amounted to as much as ½ per cent. Further, there is always a great demand for the numbers engraved on the revolvers on board. On landing in different ports in the same country, these useless control formalities are frequently repeated. Iraq further demands that the manifest for a packet which passes through Iraq in transit shall be stamped by the Customs at the port where it finally leaves the aeroplane, and sent back to the Customs at Baghdad.

Connections

The air line Amsterdam-Batavia should not be regarded solely as an express service between two parts of the realm of the Netherlands, but rather as an express service between Europe and Asia, and even, in view of the connections which it gives, between Asia and Africa and even Asia and the United States. The fact that the most obvious connection, that with Australia—only two days' journey or 15 hours' flight separates Netherlands India from the fifth continent—has not yet been brought about, is not due to any reserve on the part of Dutch air transport circles.

If one just studies the connection, then we see first of all that at the European terminus of the line, all the means of communication—in the first place the great West European air lines—run in connection, whilst an express service to America is also possible. If we consider the Indian terminus of the line, then we see connections by air with Samarang and Surabaya and connections by train from Alor Star with Penang and Singapore, whilst Batavia, Surabaya and Singapore form junctions from which one can proceed farther by boat to practically all the principal places in the Far East, such as to the chief towns of China, Japan and the Philippine Islands, whilst there are also several very good connections by boat to and from Australia. At Bangkok, one can travel farther with the Air Orient to Saigon and shortly to Hanoi, Hongkong and Shanghai. At Karachi there is a connection with the mail line of British India, linking up Bombay and Madras. At Cairo there is the connection already mentioned of the Imperial Airways to Capetown. Arrangements have already been made with various transport companies by which passengers can book through to their destinations.

Co-operation with Foreign Companies

When discussing the organisation of agencies, it was pointed out that co-operation was sought in many countries with existing air transport companies. At the present time three companies maintain air traffic between Europe and Asia: Imperial Airways, the Air Orient and the K.L.M. A very close co-operation has gradually been arrived at with Imperial Airways and the French company Air Orient.

The Future

And now we approach what might be called a picture of the future.

In the two years in which the Indian line has been operated, one can already see such considerable progress in the sphere of ground organisation—aerodromes, wireless, direction-finding, weather reports, lighting, hangars—as well as in the sphere of aeroplane construction and navigation, that there is no reason why expectations which to-day might appear fantastic should not be realised.

How do we see the future?

In the first place, an increase in the number of flying hours per day. This will become possible by an extension of the meteorological services, an increase in the hours during which the wireless stations function and by night-lighting of the aerodromes. On board of the machine, an increase of the crew to probably three pilots, two Marconists and one mechanic, six men, thus, instead of four.

It means also, however, increased comfort on board, more room, less noise and the existence of berths for resting.

In the second place, keeping pace with the increase in the number of flying hours per day, *an increase in the speed of the machines* will be forthcoming. This has always been the aim of the K.L.M. The F. VIIb (1929-1930) had a cruising speed of 165 km. (100 miles); the F. XII (1931), 185 km. (115 miles); the F. XVIII (1932), 195 km. (122 miles); whilst the F. XX, now in course of construction at the Fokker Works, shall have a cruising speed of 245 km. (155 miles) and the F. XXXVI of 225 km. (140 miles).

In the third place, *an increase in the loading capacity of the machines*, in order to arrive at an increase in the express transport of passengers and goods.

In the future, the journey from Amsterdam to Batavia, thanks to the increase of speed and longer daily stages, as sketched above, will prove possible in four days.

The traveller, who even now does not find the journey in nine or ten days at all fatiguing, thanks to the comfort and sufficient opportunity to rest, will, in the larger machines, be able to enjoy sufficiently his night's rest. The day journey will begin about two o'clock in the morning and last, with interruptions for tank-filling, till about five o'clock in the afternoon. The traveller can then repair to an hotel, get a wash, dine and rest, then stepping on board he can rest again. Also during the day there will be opportunity enough for resting, as indeed there is to-day.

The Discussion

Lt.-Col. Shelmerdine, Director of Civil Aviation, opened the discussion by congratulating Mr. Plesman on a very interesting lecture. He said that at present the K.L.M. and Imperial Airways were operating to a considerable extent over the same route, and he looked forward to this co-operation being continued when in the future the air mail route was extended to Australia. He recalled that a great deal of the ground organisation on the K.L.M.'s route to the East was done by Great Britain. When he went to India as Director of Indian Civil Aviation in 1927 he was up against the difficulty of knowing quite what to do beyond Calcutta, whether to choose the landplane or the seaplane. In the end he came to much the same result as Mr. Plesman and chose the landplane route, largely because no money was available for seaplane bases. He was glad the views he then held were confirmed by Mr. Plesman. There was one question he would like to ask, viz., when going on from Bangkok onwards would it not be better to go along the east coast rather than to cross over.

Lt.-Col. Barrett Leonnard expressed his thanks to the lecturer on behalf of Imperial Airways. He said that apparently Mr. Plesman added to his many other qualities that of being something of a diplomat, since he had been able to hang on in Persia while they (I.A.) had been thrown out. Imperial Airways had been very glad to give all the assistance they could to the K.L.M. Mr. Plesman had referred to the attitude of the Dutch Postmaster General. Our experience with the Post Office had not been quite the same, but on the other hand, our line got a substantial subsidy from the British Air Ministry. Concerning the types of aircraft chosen by the K.L.M., he thought the lecturer should look into such modern British machines as the Handley Page *Hannibal* and the Armstrong Whitworth *Atlanta*. Mr. Plesman had referred to a speeding up of the route to the East, but he was not quite clear how this was going to be achieved; in other words, how he was going to pay for his extra speed. Lt.-Col. Barrett Leonnard then read out some statistics dealing with the mails, passengers and goods carried by Imperial Airways in comparison with those given by Mr. Plesman for the K.L.M. He was in serious disagreement with the lecturer on the question of the relay system. He thought that the duties which the K.L.M. expected from their pilots were far too heavy to impose on one man.

Sir John D. Siddeley remarked that he had known Mr. Plesman for a large number of years, and had always had a high opinion of the K.L.M. air service, and after listening to the lecturer he thought all would agree that one felt that in the hands of the K.L.M. civil aviation had a great future. He was particularly impressed by the manner in which Mr. Plesman had brought out the fact that the results achieved had only been possible to accomplish through good organisation, and the statement that it took five to six years to train a mechanic to the point where he was considered good enough to go on the Amsterdam-Batavia route, showed the thorough training upon which the K.L.M. insisted.

Mr. F. Handley Page had one or two questions he would like to put to the lecturer. He had, he said, been particularly struck by the reference to the reduction in weight of the Fokker machine. That a machine was heavier than desired was not altogether unknown, even in this country, but he was slightly puzzled concerning how they had afterwards managed to get the weight down. The lecturer had referred to the use of Elektron for seats,

(*Concluded on page* 168)

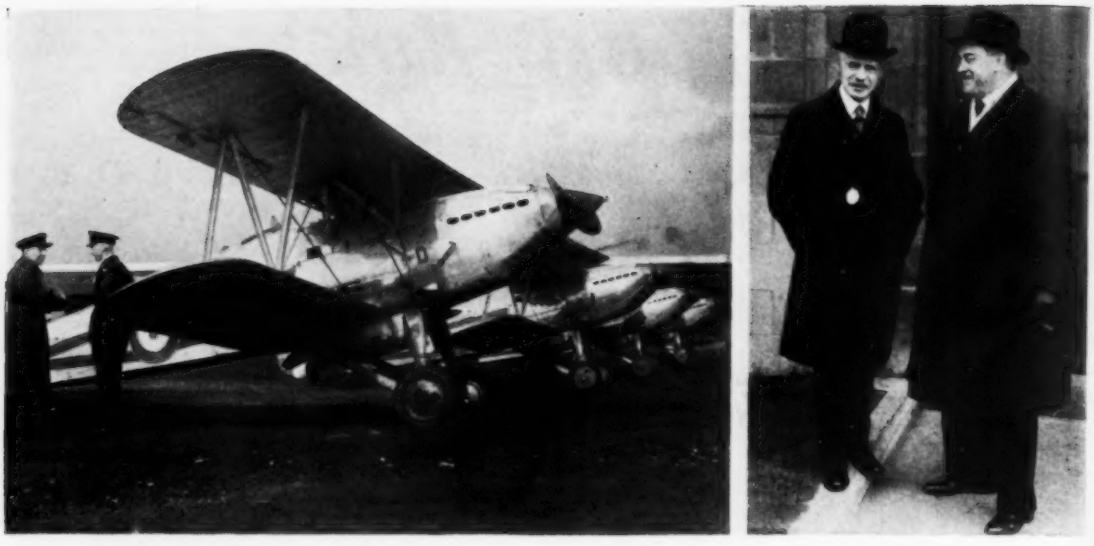
Airport News

THE ARGENTINE VICE-PRESIDENT AT CROYDON: Dr. Don Julio A. Roca and members of the Argentine Mission in front of Imperial Airways' Handley Page 42 airliner *Hengist*. (FLIGHT *Photo.*)

ARGENTINE VICE-PRESIDENT AT CROYDON

ON Saturday, February 11, Dr. Julio Roca, Vice-President of the Argentine Republic, with members of the Argentine Mission, visited the London Airport at Croydon. The Mission included His Excellency Señor Dr. Don Manuel E. Malbran, Argentine Ambassador in London; Señor Dr. Don Miguel Angel Carcano; Señor Dr. Don Guillermo Leguizamon. Col. Don Alberto de Oliveira Cesar and Capt. Don Francisco Stewart, C.V.O. (Attachés). Señor Don Toribio Ayerza and Señor Don Adolfo Orma, junr. (Secretaries). They were received by Lord Londonderry, Secretary of State for Air; Lt. Col. F. C. Shelmerdine, Director of Civil Aviation; Air Marshal Sir Vyell Vyvyan and Mr. Hubert Scott-Paine (Directors of Imperial Airways), Lt. Col. H. Burchall (assistant general manager of Imperial Airways) and Sir John Siddeley (chairman of the S.B.A.C.). First of all they inspected the control tower, expressing their admiration at the efficient way in which this was run. They then descended to the tarmac, where the *Hengist*, one of the H.P.42 Imperial Airways airliners, was waiting. This machine was examined before proceeding further to the civil aircraft drawn up in front of the hangars. These included the

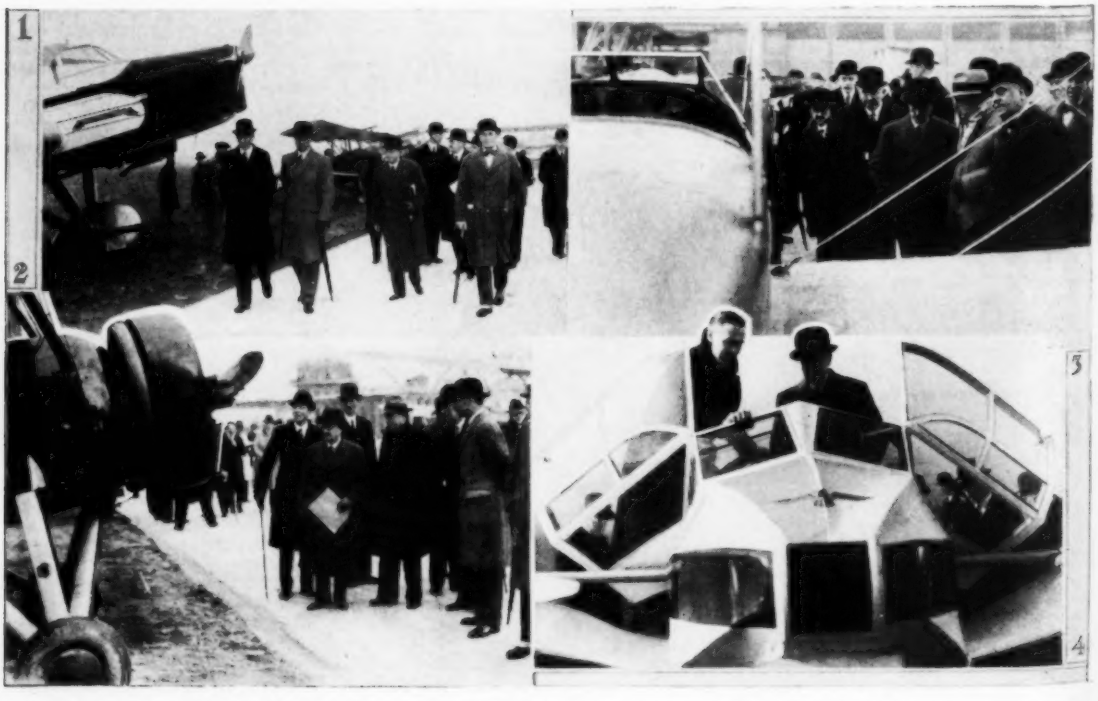
The Argentine Mission inspects the latest addition to Imperial Airways' fleet—the Armstrong-Whitworth *Amalthea*. (FLIGHT *Photo.*)



THE ARGENTINE MISSION AT CROYDON : (Left) Hawker " Furies " of the R.A.F. which gave a display of aerobatics. (Right) Sir John Siddeley (Chairman, S.B.A.C.) and Mr. Hubert Scott-Paine (Director, Imperial Airways) were amongst those who received the Mission. (FLIGHT *Photos.*)

Spartan " Cruiser " (three " Gipsy III's "), Westland " Wessex " (three 7-cylinder " Genets "), D.H. " Dragon " (two " Gipsy Majors "), " Monospar " (two " Pobjoys ")—Dr. Roca showed great interest in this machine, getting into the cabin, where Mr. Jackaman explained its many interesting points—a Blackburn " B.2 " trainer (" Gipsy III "), a D.H. " Tiger Moth " (" Gipsy III "), Avro 626 " Trainer " (" Lynx "), Avro " Cadet " (7-cylinder " Genet "), D.H. " Moth " (" Gipsy II ") and " Redwing " (" Genet "). At the end of the line was the *Amalthea*, one of the new Armstrong-Whitworth " Atalanta " class (four Armstrong Siddeley " Serval " engines). Several members of the mission examined the comfortable cabin of this machine.

About this time *Heracles* arrived from Paris, and after the passengers had disembarked Dr. Roca and his party took their places. They then made a short flight over London, and Dr. Roca, who admitted that this was his first flight, said that it was one of the most enjoyable experiences he had ever had. On returning to the aerodrome, they again went up to the control tower to watch a combined aerobatic display by two Hawker " Furies " (R.R. " Kestrels ") from No. 1 (Fighter) Squadron stationed at Tangmere. The pilots, F/O. J. L. M. Davys



THE TOUR OF INSPECTION : The Argentine Mission inspected several types of aircraft at Croydon, amongst which were (1) the Spartan " Cruiser," (2) Avro " Trainer," (3) Blackburn " B2 " trainer and (4) the " Monospar." (FLIGHT *Photos.*)

and Pilot Sergt. Scraggs, showed the efficiency in climb and manœuvrability possessed by these products of the Hawker factory. They were naturally hampered by the possibility of commercial aircraft arriving at the Airport, but nevertheless they upheld the prestige which our fighting aircraft have already established all over the world.

CROYDON

CAPT. A. F. MUIR, who left Croydon last month in a "Monospar" for Patiala, India, accompanied by Mr. Man Mohan Singh and a flying mechanic, reached his destination in exactly seven days, a journey of approximately 4,000 miles, which they flew in easy stages.

The firm of Rollason, Muir & Rickard is now known as the Rollason Aviation Co., Ltd., and good progress is being made both at Croydon and Ford aerodromes.

On Saturday, February 11, R.A.C. had a special charter to Cambridge to carry out some aerial photography in G-AAZI, flown by Mr. George Watson, who was a "B" licence pupil of the school before joining their staff of pilots.

Saturday, February 11, was the most eventful day of the week, for in the morning the Argentine Trade Delegation visited the aerodrome, where they inspected a large number of British aeroplanes, as described above. After their tour of inspection they flew in one of Imperial Airways' 42-seater airliners, and concluded their visit by witnessing a display by four R.A.F. Hawker "Furies."

Surrey Flying Services arranged the sale of a "Puss Moth" for Saturday afternoon to Mr. S. Harris, who has recently learnt to fly. Mr. Harris intends to use this machine to fly to Egypt, and will leave Croydon during the next two or three weeks. He will be accompanied by Mr. S. F. (Timber) Woods.

Mr. Hancock had an unfortunate mishap on Saturday while flying with a pupil. He forced landed in a field at Nutfield, Surrey, and ran into a barbed wire fence. The wings of the machine were damaged and the aeroplane, which had to be dismantled, was brought back to Croydon by road in the evening.

Mr. Vinko de Konjikovic, who spent approximately three years at Croydon taking a complete course in ground engineering and flying with B.A.T. and left for his native home in Yugoslavia last December, where he had hoped to obtain a commission in the Air Force, has returned to Croydon. Mr. Vinko de Konjikovic stated that owing to the state of the country, which is on the verge of a revolution, it was impossible for him to enlist, and he is hoping to find employment in England.

A flying club has been formed by the General Electric Co., which is being operated by B.A.T. at Addington. Already there are 16 flying members, one of whom saw service as a pilot during the war.

A special charter was carried out on Saturday, February 11, by F/O. C. Allen, of Hillman Airways, Croydon, in a "Puss Moth," to Neunkirchen. He was accompanied by a Press photographer who obtained some excellent photographs of the disaster.

Sir Eric Geddes arrived at Southampton on Monday, February 13, from Cape Town and boarded a 42-seater airliner which arrived at Croydon shortly after 10 a.m.

Sir Eric was met at the airport by Col. Shelmerdine, Director of Civil Aviation.

Imperial Airways, I am told, have placed an order this week with Messrs. Short Bros. for two flying-boats. They will be similar in construction to the "Scipio" class, but will be fitted with more powerful engines. The payload will be 3½-4 tons, and they will have seating capacity for 40 passengers. Delivery will be made in six months.

The total number of passengers for the week was 948; freight, 43 tons 10 cwt.

"HORATIUS."

FROM HESTON

AMONG the machines flying at Heston on Monday, February 6, were one "Autogiro," one "Fox Moth," one "Meteor," one "Puss Moth," one Spartan, one Avro 504K.

On Tuesday, February 7, the Master of Sempill left for Jersey in his "Puss Moth."

On Wednesday, February 8, Lady Clayton East Clayton took delivery at Heston of a new three-seater Spartan ("Hermes IV") from Henlys, Ltd. Lady Clayton is flying to Egypt to continue the search commenced by her husband, the late Sir Robert Clayton, for the lost oasis in the Libyan Desert.

On Thursday, February 9, Mr. Brie came over in an "Autogiro" to show its merits to a group of foreign visitors. One young gentleman arrived rather late in the afternoon, and expressed a desire to see Windsor and Eton from the air (one of the favourite districts for joy rides and of which we do a large number during the season), also to loop. Although told it was very rough, he persisted in proceeding, but when asked by the pilot if he should loop, decided to postpone that experience, and acknowledged on landing that he had been well shaken up, although thoroughly enjoying the trip. Visiting machines were five "Moths," two "Puss Moths," three Spartans, one Segrave "Meteor," one Klemm.

Friday, February 10, was a beautiful morning, and Airwork School of Flying was kept fully occupied. One machine cleared Customs for Paris, one arrived from Brussels and one from Berck. About 3.30 p.m. Mr. A. B. Gibbons arrived from Berck in his Klemm ("Pobjoy"), and about 4.30 p.m. Mr. R. L. Malone arrived from Brussels in his Spartan, with Mr. Leigh as passenger. They stated that the weather was not too bad as far as Croydon, but from there to Heston was dreadful. They had returned from Friedrichshaven, where they had been shown over the *Graf Zeppelin*. They found power cables across the Rhine at a height of 300 ft., which would prove particularly dangerous in thick weather to aviators unaware of their presence, as they were. Maj. E. E. D. Shaw arrived also about 4.30 p.m. in his Avro "Cadet" from Yorkshire, and stated that when setting off the visibility was quite 30 miles. He also was glad to land at Heston after experiencing frightful conditions in the storm which extended some miles from Heston.

The terrible explosion in Germany caused quite a stir at Heston. Proceedings started just after midnight with notification that Customs was required. The Customs officer was fetched from his home (not greatly to his satisfaction, we fancy). All requirements for quick departures for abroad are available at Heston, so that carnets, A.A. air route maps, etc., were ready when the parties arrived to clear Customs. The first machine off was a "Puss Moth" of Banco, which left at 5.45 a.m., the floodlight being used for the purpose. This was followed by a second machine of theirs at 6 a.m., both bound first for Cologne. Capt. Birkett left at 7 a.m. bound direct for Saarbrucken. Banco's "Puss Moth" G-AAXX arrived back at 4.15 p.m., having done the journey direct from Saarbrucken in 5 hr. 20 min. Capt. Birkett arrived soon after.

De Havilland's demonstration "Dragon" (G-ACAO) arrived at Heston around midday, and was quickly surrounded by an interested crowd.

Mr. A. W. A. Whitehead and Sir A. P. Hope left Heston on Saturday in a Spartan, formerly the property of the Household Brigade Flying Club, for a tour to Cairo, Nairobi and Southern Rhodesia. Mr. Steward, of Iona Airways, arrived in "Fox Moth" EI-AAP from Dublin with two passengers to witness the Rugby International Football match between England and Ireland.

An American, on a trip to Europe, having been recommended to come to Heston, called in for a test flight. He was favourably impressed with our light planes and intends to do a considerable amount of flying in order to visit places of interest in England.

Airwork School of Flying had a full day's bookings, three new pupils commencing instruction.

Sunday, February 12, although cold, was a fine morning, and the Flying School started early. Owing to the rush of pupils, an extra machine had to be taken into service. Mr. W. A. B. Pakenham, of the Border Regiment, carried out his first solo.

Mr. Steward cleared Customs and left for Dublin with two passengers in "Fox Moth" EI-AAP. Lady Clayton East Clayton and Lt. Com. Raundell left for Paris, the first leg of their trip to the Libyan Desert.

Capt. Birkett was off at dawn for Neunkirchen, returning later in the day, while Banco's second machine also returned from there with further pictures of the devastated area.

Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

CHEAPER LIGHT AEROPLANES

[2827] With reference to the letter from Mr. E. W. Walford in the issue of FLIGHT for February 2, I should like to inform you that I have designed a two-seater training or cruising aircraft that has a similar performance and load-carrying capacity to the original "Cirrus Moth."

I am arranging to have this machine manufactured in the near future by a well-known British firm.

The price of this aircraft will be £430 with the present engine, or £500 with a better type of engine.

There is nothing abnormal about this aeroplane and its robustness and flying qualities compare favourably with the normal club machine. It is definitely not a motor-assisted glider.

If interested persons will write to me on this subject I will send them full particulars of the new aircraft and in the meantime a knowledge of their possible requirements will greatly assist me in arranging the production scheme.

ROGER S. DICKSON.

Southampton,
February 2, 1933.

"DISARMAMENT AND CHEAPER AIRCRAFT"

[2828] One can usually depend on interesting comments in FLIGHT editorial, and those in the current issue and the second part of Editorial Comments in No. 1256 are so vital, I crave a little space in your correspondence columns to make a few remarks apropos your expressed opinions.

In the first place, I am not alone in considering that FLIGHT is doing a real job of work by agitating for drastic revision of existing control of civil aviation, and a modification of the present system regarding C's. of A.

Contemporary journals could do worse than take up the pen or set up the type—mighty weapons—"Go thou and do ditto."

A dispassionate review of the whole situation will show that as far as advancing in a *substantial* manner the "cause of civil aviation," our aeronautical intelligentia have little to their credit.

One cannot accuse them of being entirely void of "grey matter," but they most certainly are guilty of failing to exercise their abilities by their incompetence to devise a practical working policy likely to solve the present difficulties.

Our experts, after a discussion, lapse into a state of semi coma only to awaken on the date of the next annual dinner or conference, and talk about or listen to secondary matters.

Mr. Wingfield pleads for "getting down to brass tacks." The British public have been asking that—in their capacity of prospective private owners—for years.

But, do the people who are responsible for fostering(?) civil aviation understand what constitutes "brass tacks"? Apparently not. The lads with the bulging foreheads say "We will stage a pow-wow." What happens? Mr. Such and Such rears up on his hind legs, clasps his hands firmly behind his back, clears his throat, and—"all the air a solemn stillness holds."

With gaping mouth and twitching ears the representative assembly hangs on his lips.

Then ensues an oration on disarmament or why future aircraft for private use should be constructed of olive branches on the lines of a streamlined perambulator—complete with C. of A.—instead of conforming to orthodox design; that they may look more "peaceful" and be regarded consequently as unsuitable war material.

Tripe—and poor quality stuff at that. A talk on "Aunt Mabel's bad leg" or "Uncle John's neurasthenia" would be more apposite.

The public definitely do *not* require hot stuff, high performance machines. When they do start—pardon me, *can* start—buying, their resources will not run to "stabling" a "Hart," a "Firefly," or anything with "egg" carrying capabilities or hell-for-leather at 15,000 ft.

The sooner these dilettanti realise that cheap, light aircraft marketed at a *popular* price are, in themselves, instruments of disarmament, the more thought will be directed towards ways and means to facilitate production.

A country's chief reason for arming is fear or suspicion of another, and that suspicion or fear can only be eradicated by friendly intercourse and reciprocity.

Psychologically, this principle applies to individuals even as it does nations.

Human nature being what it is, the person "next door" must ever remain an "unknown quantity," while a wall of doubt separates his demesne from that of your own. He for his part probably regards you in the same light. The aeroplane enables that barrier of "the wall between" to be flattened out. It's a simple matter with the wall demolished for him to drop in occasionally for a drink and a *tête à tête*, and for you to return the compliment.

You will discover that he is quite human and his problems as a human being bear a remarkable similitude to your own.

International friendship and sympathetic understanding is in our own hands—if we want it. The world and his wife will make far more efficient ambassadors and ambassadresses extraordinarily sincere than wire pulling and axe grinding politicians with their despicable intrigues and selfish efforts.

Aviation provides the means to accomplish this, to understand more fully our world and its people. Books and films are instructive, but they cannot compare with the "personal touch."

The entire prospects of an industry of enormous magnitude and possibilities are being jeopardised by this dilatoriness on the part of those people with the power to apply pressure in the right spot.

The S.B.A.C. and the R. Ae.S., collaborating with the insurance companies, should hold a meeting immediately—not in six months' time—and formulate a scheme along the lines in FLIGHT editorial; their motto shall be *facta non verba*. Civil aviation is becoming nauseated by a surfeit of talk; the time is long overdue for some action. The function of the A.M. is, as presently applied to the private owner, hopelessly antique. If the job is tackled immediately there will be ample time before the summer to "get down to brass tacks," and a different system of production. The Air Ministry, to justify its existence, must substitute its rôle of "Eagle-eyed Censor" for that of "Beneign Paterfamilias."

There are literally thousands of would-be private owners *waiting* to purchase aircraft in this country. Consider the employment to skilled engineers, to pilots for instruction, the nourishment it would afford the growth of the club movement and the wonderful stimulus to trade generally. Petrol, oil, linen, instruments, engines, steel, rubber and a thousand other things. The development of new and existing aerodromes. Its possibilities are stupendous.

The skill that places our aircraft at the present time among the world's best can also be applied to the building of inexpensive machines; with one eye on the possibilities of overseas markets. How could our manufacturers be so unenthusiastic and lethargical? It's amazing.

In conclusion, we look to the D.C.A. to lend a sympathetic ear and his whole-hearted support to suggestions advanced by the industry towards this end—cheaper aircraft.

Now then R.Ae.S., S.B.A.C., G.A.P.A.N., etc., and all connected with the industry, who will have a pop at the Gordian Knot?

M. E. HILLACRE-RICHARDS.

Plymouth,
February 4, 1933.

LATERAL CONTROL OF MONOPLANES

[2829] Referring to letter No. 2826 on Lateral Control of Thick-Wing Monoplanes. in FLIGHT, February 2, I would like to point out that the author seems to confuse effectiveness of ailerons with heaviness of lateral control.

It is well known that a wide aileron (big flap-chord ratio) gives better lateral control at or beyond the stall than a narrow-chord aileron of the same area. At the same time a wide aileron has correspondingly bigger hinge moment, and therefore tends to be heavy unless aerodynamically balanced.

Fokker and Junker are using narrow-chord ailerons with aerodynamic balance on the bigger machines. Klemm uses Frise aileron on all the later models.

The reason for using the balance flap as described in FLIGHT, January 26, on the "Monospar" machine ST4, is very simple. The machine has a wide aileron which gives very good lateral control beyond the stall, but also gives a big hinge moment at high speed. The little auxiliary flap reduces this hinge moment to practically nil; in other words, lateral control is very light over the whole speed range.

The twin-engined "Monospar" with its big lateral moment of inertia can be put into a vertical turn at full speed by holding the joy stick lightly with one finger and thumb only.

In any case, the auxiliary flap has nothing to do with the "Monospar" system in particular or with torsional strength or stiffness or taper ratio of the wing, but it is simply an adjustable aerodynamic balance for any type of control surface.

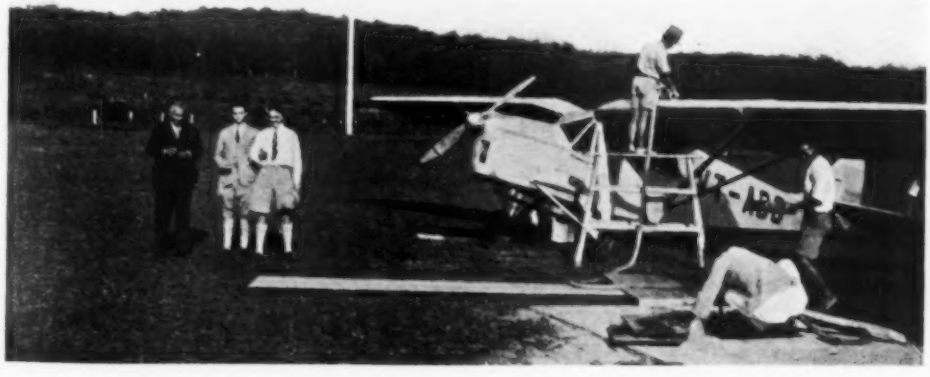
H. J. STIEGER.

Croydon,
February 6, 1933.

From the Clubs

HERTS AND ESSEX AERO CLUB.

The Herts and Essex Aero Club held their second Annual Dinner and Dance on Wednesday, February 8, in the Wharncliffe Rooms, Hotel Great Central, the chair being taken by S. A. Perrin, Esq. After a really excellent repast, the Chairman proposed the health of the King; after which Capt. W. E. Johns, in proposing the toast of "Civil Aviation," said that a better day could not have been chosen for such a gathering, and he complimented the Secretary on his perspicacity. The present year should prove revolutionary for club flying, but much depended on what help the Air Ministry were prepared to give; he himself was of the opinion that too much time and money was being spent on record-breaking machines and too little on the designing of cheaper light aeroplanes; he looked forward to the day when solo flying would cost only £1 an hour, and perhaps less. Civil aviation must go forward, because it could not go back. Lt. Col. F. C. Shelmerdine, C.I.E., O.B.E. (Director of Civil Aviation), in reply, stated that Great Britain had attained the triple crown, the speed record of 407.5 m.p.h., held by Flt. Lt. G. H. Stainforth, the altitude record of 43,976 ft., held by Flt. Lt. C. F. Uwins, and now the long distance record of 5,340 miles, attained by Sqd. Ldr. O. R. Gayford and Flt. Lt. G. E. Nicholetts in 57 hr. 25 min. The year 1933, he continued, had started badly for civil aviation, in that three great losses had been experienced, Winifred Spooner, Bert Hinkler and Geoffrey Rodd. But he was definitely convinced that nothing could stop the progress of civil aviation, and he could record, with every confidence, the completion of that most important Empire route to Australia, which would complete the linking up of this country with India, Australia and South Africa, which in these times of depression was no mean achievement. Turning to the Herts and Essex Aero Club, 20 "A" licences and 4 renewals had been obtained in the past year, and under the new Subsidies Scheme £723 had been earned, which figures speak for themselves; he congratulated the Club on what they were doing and on the results they are achieving. On the subject of Mr. Lowe-Wylde's light aircraft, he intended to do everything possible to assist in their improvement. The Air Ministry worked under certain regulations, and it was not easy for a Government Department to alter these regulations at a moment's notice, but the matter was being thoroughly pursued, and he thought that if what the Ministry had already done be considered, it must be admitted that everything possible had been done to assist the development of these light machines and to remove restrictions as regards experimental flying of this type. Permission had been granted, he said, for them to be flown within 3 miles of Hanworth, Heston, and other aerodromes by licensed pilots; he hoped the Air Ministry would be able to go farther, and thought that the idea had their greatest sympathy. Personally he welcomed discussion, it showed that people were taking a keen interest. The British Certificate of Airworthiness is a document of world-wide repute and we could not afford to go off the Gold Standard of efficiency and reliability which we had built up for it. Every foreign country, in placing an order in this country, insists that the aircraft shall have a Civil Certificate of Airworthiness, which shows what value abroad is attached to that certificate, and he thought it would be an ill-day for this country.



PRINCE ALI KHAN VISITS KUALA LUMPUR: On January 13 Prince Ali Khan, who is the son of the Aga Khan, called in at the Kuala Lumpur Flying Club on his way from Penang to Singapore, and again on the return journey. Prince Ali's pilot was Maj. W. H. Vetch, the chief instructor of the Bombay Flying Club, and Mr. Demeseiras occupied the third seat in the "Puss Moth." In the photograph Prince Ali Khan is seen in the centre, and Maj. Vetch on his left.

and for aircraft manufacturers in this country, if that certificate were in any way defective.

Flt. Lt. R. R. Bentley then proposed the health of the Club. He said he had just recovered from a dream, in which Roger Frogley was endeavouring to teach him how to land on the ceiling like a fly; he awoke to hear himself called upon for a speech. The total number of hours flown by the Club last year was 1,800, which meant an average of 150 per month, the month of July being responsible for 346. Since the formation of the Club 46 licences had been attained, of which three were "B" licences. The Club was shortly purchasing a new machine, which would bring their total up to four.

Mr. G. A. Perrin replied. He could inform the Club that besides the new machine mentioned by Flt. Lt. Bentley, a fifth was to be purchased before the summer. He knew he was voicing the expression of all members when he paid a deep tribute to the ladies and gentlemen of the Frogley family, who had contributed so largely to the Club's success; thanks were also due to Flt. Lt. Duncanson for his help in instructional duties. It was a great pleasure for them to have Lt. Col. Shelmerdine with them that evening.

After Mr. Leonard Henry had said a few words about income tax and pantomimes, mixed up Leicestershire with Russia, told the company about a girl who was only a bandmaster's daughter but knew how to conduct herself, and done justice, or injustice, to a quaint old Cornish town, the diners retired to dance until after midnight.

BRISTOL AND WESSEX AEROPLANE CLUB

The Bristol and Wessex Aeroplane Club are holding their annual ball at the Grand Spa Hotel, Clifton, on Friday, March 24, and the cost of the tickets will be 6s. each, including buffet. The two finalists in the Club Open Squash Rackets Competition are F. W. Dawnay and R. W. M. Hall. Mr. Dawnay is a rackets Blue and R. W. M. Hall is the club chief flying instructor.

One of the most important events at the Bristol airport during 1933 will be the flying meeting on Saturday, June 17. This event will inaugurate the Bristol-Brighton Civic Week and will have the full support of the civic authorities of both towns. The Bristol Development Board are financing the meeting and the Bristol and Wessex Aeroplane Club will be responsible for the management and organisation. It is hoped to secure Royal Air Force support, and the meeting will be on a scale similar to that held at Bristol on May 31, 1930, when the Bristol airport was opened by His Royal Highness Prince George.

SCOTTISH FLYING CLUB

The year 1932 has been a very successful one for the Scottish Flying Club; it opened auspiciously with a reduction in the charge for solo and passenger flying. April marked the commencement of a new and revised subsidy scheme in which the grants were on a more generous scale, while in May the Club's most successful pageant was staged, and a new "Puss Moth" purchased. In June 300 hr. were flown, a record number, and in the following month Col. Shelmerdine, the Director of Civil Aviation, paid the Club a visit. The next event of note was Sir Alan Cobham's Air Circus in September, and the year finished with the third annual ball, and the exchange of the four "Gipsy I Moths" for four "Gipsy III Moths."

PROGRESS AT READING

Business continues to grow in the sale and repair of aircraft despite the doleful outlook of many people connected with the trade. No long faces will, however, be seen by the visitor to Phillips & Powis Aircraft (Reading), Ltd., for the optimism prevailing there has, during the past year, brought an increasing volume of business, so much so that extensions to the workshops have become necessary. Those who have not been there for some time will find many interesting improvements. A large new hangar has been built for housing the many school and private-owners' machines. Then there is a new wood-working shop completely equipped with all the necessary machinery. The Constructional Department, in charge of Mr. F. G. Miles, is busy on an aircraft which it is hoped will appeal to economically-minded private owners, and, being a believer of doing everything thoroughly, he has already installed much equipment not usually found in smaller workshops. One of the most interesting is a vertical electric furnace for the heat-treatment of fittings, etc., wherein the articles can be hung clear of the sides of the furnace, thereby ensuring a perfectly even temperature.

The Reading Aero Club's "At Home" has been fixed for Saturday, May 27, and it is hoped that those who attend will be enabled to enjoy themselves even more than previously. The annual general meeting of the Club has been fixed for Sunday, February 26, at 6 p.m., at the clubhouse; the meeting will be followed by a club dinner. Messrs. D. E. Swann, A. G. Sims, C. A. Nepean Bishop, H. Lovelock, E. G. Williams and Sir Charles Rose have purchased a "Moth" between them, which on Sunday was kept very busy, as also was the Desoutter which did a taxi trip to Oxford. Mr. B. Mirza, of Bombay, has obtained his "B" licence and is now starting operations in India.

NORTHAMPTONSHIRE AERO CLUB

The newly-constituted Northamptonshire Aero Club opened in an auspicious manner on Saturday, February 11, with a dance in the clubhouse. This was very well attended, and if we are to judge by the remarks of a visiting member of the Brooklands staff, who when asked how he felt the following morning, said that he was all right as long as he did not turn corners quickly! was very much enjoyed by all those present. On the Sunday following, the first flying meeting of the Club was held. This was not a public occasion, but the word had been passed round to other flying clubs who consequently arrived in such force that at one time there were 26 aircraft on the aerodrome. A short flying programme was arranged to follow the opening fly-past. First Mr. "Bill" Thorn, the Club's instructor, gave one of his usual superlative displays on the Avro "Cadet" (7-cylinder "Genet"); he, like everyone else, is enraptured with the controls of this aircraft, and says that he can imagine nothing better. Following this, Mr. Eric Nelson led a formation of "Moths" from Brooklands, consisting of Capt. D. Davis and Mr. Thorn. Apart from the premature landing of one pilot who we could only imagine "forgot the last chapter," their manœuvres were very creditable in view of the comparatively small amount of practice they had had. As befits the instructor of a new club, Mr. Thorn constituted the remainder of the programme. First of all he threw a "Moth" about in a crazy fashion which must have inspired confidence in the controllability of this machine when handled by an experienced pilot in a manner but which would undoubtedly be very dangerous for the ordinary club pilot. Finally he again took the air in the Avro "Cadet" and was, we believe, only induced to come down by a shortage of petrol!

GLIDING ENTHUSIASM

The London Gliding Club is undoubtedly the gathering place for an enthusiastic band of people. We looked in there on Sunday, February 12, and found that despite the lack of wind the members had been hard at it all day, gliding off from the top of the hill and perfecting the technique of those who were not yet sufficiently trained to go in for soaring proper. Together with members of the Imperial College Gliding Club, who incidentally use the same site and house their machines in the same hangars as the London Gliding Club, they were gliding down until it was too dark to see the clubhouse from the top of the hill. It was certainly a credit to the skill of their members that the last machines were landed successfully at the bottom. The new pulley embedded at the top of the hill works admirably, and, with the help of an ingeniously arranged ancient car at the foot, the gliders are hauled to the top with a minimum of delay and effort. Over eight machines were in use during the day, including elementary trainers, intermediate machines and proper sailplanes. There was very little lift at all, and even the "Professor" was only just able to sail down the ridge, turn with a large circle and land on the return. The "Wren," however, being a nimbler machine, once managed to prolong her flight for 9 min. She is certainly a credit to English design, and we understand that her designer-builder, Cpl. Manuel, is at present building an improved version.

VICEROY'S CUP RESULT

In the Viceroy's Cup, which was held on Friday, February 10, there were twelve starters. Competitors were handicapped and the first home won. The route was from Delhi to Bareilly and return by way of Lucknow, Agna and Rampur. Capt. A. I. Riley was first home (115 m.p.h.) flying a "Moth" ("Gipsy I"), the second, third and fifth places also went to "Moths," and the fourth place to a "Gipsy III" Comper "Swift," which made fastest time (153 m.p.h.).

Airisms from the Four Winds

Third Time Lucky

MR. VICTOR SMITH, the young South African airman, who (as was reported in FLIGHT last week) left Southampton on the morning of Tuesday, February 7, on an attempt to set up a new record for a flight to Capetown, landed at Perpignan, in the Pyrénées, to refuel. He eventually arrived over Oran at 6 a.m. on Wednesday, February 8, and, while landing in the dark, crashed. His machine was badly damaged, but Mr. Victor Smith escaped with slight injuries.

Cobham's Non-Stop Plans

AN ambitious attempt on a non-stop flight from England to Australia is being planned by Sir Alan Cobham. The machine which Sir Alan proposes to use is the Airspeed "Courier" ("Lynx" engine) which we first described and illustrated in our issue of October 20, 1932. The machine, the first of which is now nearing completion at the York works of Airspeed, Ltd., has, it will be remembered, a retractable undercarriage, and is a low-wing cabin monoplane of very clean design. Its estimated cruising speed is 130 m.p.h., so that the flight should, all going well, be possible in 5-6 days, allowing for head winds, etc. We gather that Sir Alan may possibly be accompanied by Sqd. Ldr. Helmore, and that the present plans include about five refuellings, including one just after the start, to avoid taking the machine off with a very heavy load. This would presuppose a range, with full tanks, of approximately 2,000 miles. At present no information may be published concerning the machines used for refuelling.

French Long Distance Attempt

ON Friday, February 10, two French airmen, Bossoutrot and Rossi, set out from Istres aerodrome, Marseilles, in an attempt to reach South America non-stop, and thus gain for France the long distance record, and the record for the South Atlantic crossing. They were flying a Blériot monoplane powered by a 600 h.p. "Hispano-Suiza" engine. At 8.20 the same evening they force landed at Casablanca, after having covered about 1,000 miles.

Another Atlantic Attempt

THE French three-engined Couzinet monoplane *Arc en Ciel*, piloted by Capt. Mermoz, and with a crew of five, left Buenos Aires on Friday, February 10, and arrived at Rio de Janeiro at 1.15 p.m. They then flew on to Port Natal intending to cross the South Atlantic to France.

Frenchwoman's Flight to Saigon

A 24-YEAR-OLD French airwoman, Mlle. Helene Boucher, took off on Monday, February 13, from Le Bourget on a 2,500 mile flight to Saigon (French Indo-China) in an attempt to beat Mrs. Mollison's record. She is flying an Avro "Avian" machine with a 150 h.p. engine.

Reciprocal Airworthiness Agreement with U.S.A.

According to the U.S. Department of Commerce *Air Commerce Bulletin* of December 15, 1932, a tentative agreement between the British Air Ministry and the U.S. Department of Commerce has been reached. Under this it will be possible for each Government immediately to validate airworthiness certificates of aircraft manufactured in and imported from the other country.

That part of the agreement pertaining to design reads as follows: "A person applying in the United Kingdom for the validation of a United States certificate of airworthiness for export will be required to produce with the application documentary evidence from the competent authorities of the United States Government to the effect that the undermentioned special or supplementary regulations have been complied with:—

"(*a*) Aeroplanes having a gross weight in excess of 3,000 lb. and a power loading greater than 12 lb./h.p. must be investigated for, and comply with, the load factor specified by the British Air Ministry for normal category aeroplanes in the c.p. back condition.

"(*b*) Elevators which are on opposite sides of the longitudinal axis of the aircraft must be rigidly interconnected.

"(*c*) A fireproof bulkhead equivalent to a $\frac{3}{32}$-in. asbestos and 24-gauge aluminium 'sandwich' must be installed.

"(*d*) The altitude control must be so connected to the throttle control that the mixture will automatically return to the proper position for sea-level flying when the throttle is closed.

"(*e*) An air-speed indicator must be installed."

The article then sets forth the British load factor requirements for normal category aeroplanes in the c.p. back condition.

On the other side of the picture we have the following items which will be required of all British aircraft for which American licences are to be granted:—

"(*a*) All aircraft must be investigated for, and comply with, the load factors specified by the United States regulations, for the high and low angle of attack conditions.

"(*b*) Baggage or mail compartments must bear a placard stating the maximum weight which may be carried in them.

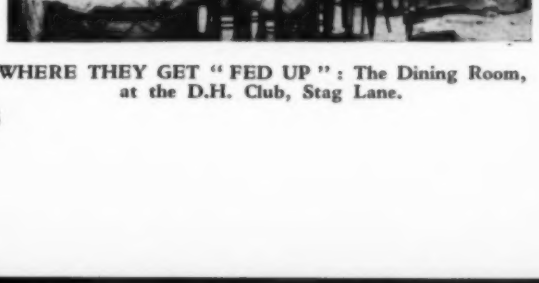
"(*c*) Multi-engine aircraft must be capable of maintaining level flight with any one engine out of commission at an altitude of 2,000 ft. after dumping fuel to the extent provided by the United States regulations.

"(*d*) The maximum landing speed specified in the United States requirements must not be exceeded."

The last paragraph is really amusing, in view of the consistently low landing speeds adopted by British designers, and the high landing speeds tolerated in a large number of American types.

Whirling Upwards

HELICOPTERS, or flying machines with rotating wings, are perhaps one of the oldest ideals striven after by inventors of every country. In England we have had many attempts to produce a machine which will rise vertically from, and return vertically (and safely) to, the ground. During the war Farnborough saw the hopes of several inventors dashed when their efforts made nothing more substantial than flights of fancy. Since the war, however, people have grown accustomed to flying by means of rotating wings through the success of Señor de la Cierva's "Autogiros," but, as our readers know, these are not Helicopters in the true sense, as their blades are not driven but auto-rotate. Apart from the efforts of one Isacco, we have not had any promising real Helicopters in England until today. Now, at Heston, two young Austrian engineers, Herr Bruno Nagler and Herr Raoul Hoffner, are erecting a Helicopter which certainly looks promising. They claim to have achieved more than anyone else in providing their machine with a device whereby the incidence of the blades can, during rotation, be varied. Only, not only can the incidence of all three blades be varied together, but a control, giving in effect the same control as a normal "joy-stick," alters the incidence of the blades as they pass any one particular point. The machine is driven by a 40-h.p. Salmson engine, and the blades being on a free-wheel device allow it to be used as an "Autogiro" should the engine fail. At present we are asked not to give full details of this promising attempt to provide vertical ascent and descent, but we hope to do so after it has flown, in about 14 days' time. The forerunner and cruder version has, we understand, made some 70 short flights, so we wish the two inventors success with this, their latest model.



WHERE THEY GET "FED UP": The Dining Room, at the D.H. Club, Stag Lane.

The Industry

SHORT BROS. ANNUAL STAFF DINNER

THE staff of Short Brothers, Ltd., of Rochester, held their annual dinner at the Strand Palace Hotel, London, on Saturday, February 4. As in previous years, the party, consisting of approximately 100 assembled at the Rochester Esplanade at 3 p.m. and journeyed by Maidstone & District Luxury Coaches to the London Palladium, where they enjoyed a first-class Variety entertainment. At the conclusion of the programme the party was conveyed by coach to the Strand Palace Hotel where an excellent dinner was served. After dinner, Mr. Arthur Gouge, General Manager, proposed the toast of "The Firm," coupled with the name of Mr. H. O. Short, Managing Director. Mr. Short (who was greeted with a loud burst of applause), replying, thanked those present for the very kind way in which they had received him, and went on to say that he had begun to doubt whether there would have been an annual dinner. The firm had passed through one of the most difficult years since the Armistice, and, although he knew that quite a number of his old staff were not there, he felt relieved at seeing so many of his friends (the staff) present. "At our last dinner I struck a note of optimism, which, unfortunately, did not materialise, and we have been compelled through adverse circumstances to make drastic cuts, but it has only been due to these curtailments that we have been able to weather the storm. I must take this opportunity of paying tribute to the wonderful organising brain of our General Manager, Mr. Arthur Gouge, who, together with his staff, has handled a very difficult situation with great tact and judgment." Mr. Short, continuing, said he would not, as in previous years, make a survey of the firm's activities, but he had the utmost pleasure in announcing that events had transpired, as recently as the last few days, which enabled him to say that the coming year would undoubtedly be the busiest year since the Armistice. "Unfortunately, I am unable to give any fuller details of these activities, but I will content myself with saying that the year facing us will see our workshops full again on both the military and civil sides of aircraft." Referring to the Air Ministry officials attached to the firm, Mr. Short paid tribute to the very able way in which both Mr. J. A. C. Manson, the Resident Technical Officer, and Mr. P. H. Harrower, Chief A.I.D. Inspector at the seaplane works, carried out their official duties, which, although arduous, were always mingled with a spirit of real helpfulness. In conclusion, Mr. Short paid tribute to the work carried out on the firm's behalf by the representatives abroad and also to the able way in which the dinner, entertainment, etc., had been organised by the Sports Club Secretary, Mr. Alfred Craig.

Mr. A. Gouge, who was repeatedly called for to make a speech, said he had not intended doing so at all. He would remind them, however, that he had been called upon to do some very unpleasant things which had been much against his grain. However, he was very pleased to listen to the speech of Mr. Short, which was very encouraging, and it only remained for the Bus Sales Department to get busy and the firm could look forward to prosperous times.

Mr. W. P. Kemp, Works Manager, replying on behalf of the Bus Sales Department, referred to the many difficulties created by the present form of legislation that was being passed through Parliament. He saw no reason, however, for undue pessimism, as there were already signs of increasing orders being received.

Mr. A. E. Bibby, Works Manager (Aircraft), in a breezy little speech, spoke of the difficulties encountered during a period of slackness, and thanked Mr. Short on behalf of those present for his generosity that evening. Messrs. J. A. C. Manson and P. H. Harrower also replied to Mr. Short and assured him that so far as they were able, in their official capacity, they were both prepared to assist the firm in every possible way.

Among those present were the following:—Mr. J. H. Wood, Secretary; Capt. J. Lankester Parker, Chief Test Pilot; Capt. Mayer, London Office Representative; Mr. F. Drury, Chief Cashier; Mr. W. C. Jackson, Chief Draughtsman; Mr. C. P. Lipscomb and Mr. W. Browning, Chief Technical Assistants, and Mr. P. H. Cozens.

The party left London by saloon coach at 11.30 p.m., arriving at Rochester at 1 a.m.

British Industries Fair

THE aircraft industry in so far as aircraft are concerned will be represented at Birmingham by a "Moth" ("Gipsy II") on the stand of the de Havilland Aircraft Co., Stag Lane. This machine will be a standard one completely fitted with dual control. A salesman will be in attendance who, besides English, can speak French, Spanish and German.

Aircraft Tubing

THE Reynolds Tube Co., of Hay Hall Works, Tyseley, Birmingham, will be showing a comprehensive range of their products at Castle Bromwich. This will include both standard and special seamless tubular sections and many kinds of manipulated tube work. Tubular rivets, exhaust system bends and other similar parts are included under this heading. Taper gauge or butted tubes for aircraft axles and other members will be of particular interest, full details of which, as well as any other Reynolds products, can be obtained from the aircraft tubing catalogue issued by the company.

Welding

Two of the pioneer arc-welding companies, namely, Alloy Welding Process, Ltd., and the Premier Electric Welding Co., have amalgamated under the name of Murex Welding Processes, Ltd. Their stand at the B.I.F. will be particularly interesting and demonstrations will be given, using electrodes suitable for all kinds of special steel. One of these, known as FASTX, has been developed in particular for high-speed arc-welding, while another, known as HARDX, deposits metal of which the Brinell hardness number is 640 to 670. A hand bend testing machine will also be shown which provides a rapid and inexpensive method of determining the ductility of a welded joint.

De-greasing

Imperial Chemical Industries will be showing the latest development of their de-greasing plant, which our readers will recollect was fully described in FLIGHT for December 18, 1931. One of the plants developed during the past year successfully handles small parts in such a way that these can be tipped in without separation and emerge at the other end absolutely clean without any rotation or mechanical agitation whatsoever. On the stand of the Cassel Cyanide Co., Ltd., a subsidiary of the I.C.I., there will be an extensive range of salt bath furnaces for the heat-treatment of metal. Examples are also shown of the Cyanide process of case-hardening, and furnaces will be running available for the case-hardening or heat-treatment of samples which may be brought by visitors.

British Industries from the Air

AEROFILMS, LTD., of Bush House, London, W.C.2, have arranged at Olympia and at the Birmingham sections of the British Industries Fair, a special exhibition of Aerial Photographs representing the works and factories of various British industries. Thus, there will be on view a range of pictures representative of the important industries of the country that will not only attract attention, but also have an educational value.

Mr. Owen J. P. Wray

THE many friends of Mr. Owen J. P. Wray will learn with regret of his retirement from the board of directors of Silvertown Lubricants, Ltd. For nearly 30 years Mr. Wray has served the firm, and during the whole of that period he has been a much respected and prominent figure in the building up of the prosperous business at Minoco Wharf. Mr. J. Russell-Knowles, who has also been for many years with Silvertown, is now managing director.

THE ROYAL AIR FORCE

London Gazette, February 7, 1933.

General Duties Branch

H. S. Laws (Pilot Officer, Special Reserve) is granted a short service commn. as Pilot Officer on probation with effect from and with seny. of Jan. 23; Lt. F. W. N. Bassett, R.N., is re-attached to R.A.F. as a Flying Officer with effect from Jan. 26, and with seny. of Sept. 1, 1926; Lt.-Cdr. F. M. R. Stephenson, R.N., is re-attached to R.A.F. as a Flight Lt. with effect from Feb. 1, and with seny. of July 1, 1930. The following Pilot Officers on probation are confirmed in rank:—E. V. Knowles (Dec. 28, 1932); A. N. Spottiswoode (Feb. 4).

The following Pilot Officers are promoted to rank of Flying Officer:—R. Cleland (Nov. 29, 1932); H. F. Boss-Walker (Jan. 10); G. L. Menzies, J. J. Zwarenstein (Jan. 11); A. McIlwaine, W. E. Oulton, R. H. Page, G. J. L. Read, W. H. N. Turner (Jan. 25); W. J. F. Bull, C. D. P. Franklin, O. A. Morris, W. J. Small (Jan. 26). Flying Officer A. M. Watts-Read takes rank and precedence as if his appointment as Flying Officer bore date Dec. 29, 1929, immediately following F./O. R. R. Frith on the gradation list. Reduction takes effect from Jan. 3; Flight Lt. R. F. Part is placed on half-pay list, Scale B (Jan. 23); Lt. A. C. R. Duvall, R.N., ceases to be attached to R.A.F. with effect from Jan. 20 on return to Naval duty, and is re-attached to R.A.F. as Flying Officer with effect from Feb. 1 and with seny. of June 10, 1929. Flight Lt. L. E. M. Gillman is placed on retired list on account of ill-health (Feb. 8). The following Flying Officers are transferred to Reserve, Class A:—M. E. Pickford (Jan. 24); H. L. Piper (Feb. 7).

Lt. W. H. Parkin, R.N., Flying Officer R.A.F., relinquishes his temp. commn. on return to Naval duty (Aug. 3, 1932). (Substituted for *Gazette*, Oct. 18, 1932.)

Stores Branch

Pilot Officer on probation C. F. Harrington is confirmed in rank and promoted to rank of Flying Officer (Jan. 8); Flight Lt. H. Cartwright is placed on retired list (Feb. 3).

Medical Branch

A. H. Osmond, M.R.C.S., L.R.C.P., is granted a short service commn. as Flying Officer for three years on active list with effect from Jan. 16 and with seny. of April 19, 1932; L. M. Corbet, M.B., B.S., is granted a short service commn. as Flying Officer for three years on active list with effect from and with seny. of Jan. 16. The following Flying Officers are promoted to rank of Flight Lt.:—F. W. P. Dixon, M.B., B.S. (Jan. 20); E. Corner, M.R.C.S., L.R.C.P. (Jan. 28).

The following Flight Lts. are transferred to Reserve, Class D (ii) (Feb. 2):—J. B. Murphy, M.B., B.Ch., L. O'Connor, M.B., B.Ch.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Senior Sister Miss J. D. Jackson is promoted to rank of Acting Matron (Feb. 10); Sister Miss G. E. M. Clubb is promoted to rank of Acting Senior Sister) Feb. 10); Matron Miss M. Moddrel, R.R.C., is placed on retired list (Feb. 9).

ROYAL AIR FORCE RESERVE
RESERVE OF AIR FORCE OFFICERS

General Duties Branch

Flight Lt. J. B. Stockbridge is transferred from Class A to Class C (Jan. 18); Flying Officer G. R. M. Garratt relinquishes his commn. on account of ill-health (Feb. 8); Flying Officer G. R. A. Pallin relinquishes his commn. on completion of service (Jan. 31).

SPECIAL RESERVE

Pilot Officer H. S. Laws relinquishes his commn. on appointment to a short service commn. in R.A.F. (Jan. 23).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain A. C. Maund, C.B.E., D.S.O., to No. 2 Flying Training School, Digby, 26.1.33, to Command *vice* G/Capt. S. Smith, D.S.O., A.F.C.

Wing Commanders: D. Stewart, M.C., A.F.C., to Home Aircraft Depot, Henlow, 30.1.33, for Administrative duties *vice* W/Cdr. B. L. Huskisson, D.S.C. J. Leacroft, M.C., to No. 1 School of Tech. Training (Apprentices) Halton, 27.1.33, for Administrative duties *vice* G/Capt. H. J. F. Hunter. A. Lees, A.F.C., to No. 1 (Indian Wing) Station, Kohat, India, 10.1.33, to Command *vice* W/Cdr. D. G. Donald, D.F.C., A.F.C.

Squadron Leaders: H. H. Massey, M.C., to R.A.F. Staff College, Andover, 23.1.33, for Staff College Course (No. 11). J. J. Williamson, A.F.C., to No. 4 Flying Training School, Abu Sueir, 27.1.33, for duty as Chief Flying Instructor. H. P. Lloyd, M.C., D.F.C., to No. 1 (Indian) Group H.Q., Peshawar, 2.1.33, for Air Staff duties *vice* S/Ldr. L. N. Hollinghurst, O.B.E., D.F.C. W. Elliot, D.F.C., to No. 501 (City of Bristol) (B) Squadron, Filton, 17.1.33, to Command *vice* S/Ldr. R. S. Sugden, A.F.C. P. J. Barnett, M.C., to H.M.S. *Eagle*, 1.2.33, for Armament and Flying duties. A. D. Pryor, to No. 60 (B) Sqdn., Kohat, India, 10.1.33, to Command *vice* W/Cdr. K. M. St. C. G. Leask, M.C. J. L. Vachell, M.C., to No. 207 (B) Sqdn., Bircham Newton, 1.2.33, to Command *vice* W/Cdr. J. W. Woodhouse, D.S.O., M.C.

Flight Lieutenants: C. H. Cahill, A.F.C., to H.M.S. *Glorious*, 9.1.33. S. E. Storrar, to H.Q., R.A.F., Middle East, Cairo, 27.1.33. J. Turner, to R.A.F. Depot, Middle East, Aboukir, 27.1.33. V. Q. Blackden, to No. 31 (A.C.) Sqdn., Quetta, India, 31.12.32. F. H. Isaac, D.F.C., to No. 2 (Indian Wing) Station, Risalpur, 1.1.33. A. B. Woodhall, to No. 22 (B) Sqdn., Martlesham Heath, 23.1.33. R. Ivelaw-Chapman, D.F.C., A.F.C., to Air Ministry (Dept. of C.A.S. (D.O.I.)), 17.1.33. L. de V. Chisman, to Air Armament School, Eastchurch, 6.2.33. M. C. Dick, A.F.C., to Air Armament School, Eastchurch, 6.2.33. F. J. Fressanges, to H.Q., Air Defence of Gt. Britain, Uxbridge, 1.2.33. C. A. Hoy, M.C., to R.A.F. Base, Gosport, 30.1.33. P. J. A. Hume-Wright, to H.M.S. *Eagle*, 1.2.33. N. A. West, to No. 2 Armoured Car Co., Ramleh, Palestine, 21.1.33.

Flying Officers: F. J. St. G. Braithwaite, to Home Aircraft Depot, Henlow, 2.1.33. H. P. Fraser, to Home Aircraft Depot, Henlow, 2.1.33. E. L. Mole, to Home Aircraft Depot, Henlow, 2.1.33. P. G. Thomson, to Home Aircraft Depot, Henlow, 2.1.33. R. G. C. Arnold, to No. 2 Armoured Car Co., Ramleh, Palestine, 27.1.33. J. A. Dobson, to No. 70 (B.T.) Sqdn., Hinaidi, 27.1.33. A. C. Drew, to No. 55 (B) Sqdn., Hinaidi, 27.1.33. W. E. Hooper, to No. 70 (B.T.) Sqdn., Hinaidi, 27.1.33. A. W. Hunt, to No. 4 Flying Training School, Abu Sueir, 27.1.33. J. G. Mansfield, to No. 70 (B.T.) Sqdn., Hinaidi, 27.1.33. H. E. Sales, to Administrative Wing, Halton, 30.1.33. N. Kirkham, to No. 27 (B) Sqdn., Kohat, India, 1.1.33. H. N. G. Ramsbottom-Isherwood, to No. 27 (B) Sqdn., Kohat, India, 1.1.33. L. Watson, to Marine Aircraft Experimental Estabt, Felixstowe, 30.1.33. W. E. Coope, to No. 100 (B) Sqdn., Donibristle, 31.1.33.

Pilot Officer H. W. A. Chesterman, to No. 11 (B) Sqdn., Risalpur, India, 1.1.33.

Acting Pilot Officers: The undermentioned Acting Pilot Officers are Posted to No. 4 Flying Training School, Abu Sueir, on 27.1.33:—F. E. H. Cooper, H. M. Cox, R. J. F. Craig, G. W. Golledge, W. M. Graham, N. W. D. Marwood-Elton, F. D. Nugent, B. J. Paul, A. Ross, A. G. Strutt, H. C. S. Vetch, C. H. D. Wardrop, E. H. Wheelwright, and C. F. C. Wright.

Stores Branch.

Wing Commander W. Millett, O.B.E., to H.Q., Air Defence of Gt. Britain, Uxbridge, 30.1.33, for Stores duties.

Flight Lieutenants: L. J. V. Bates, to R.A.F. Staff College, Andover, 23.1.33. M. H. Jenks, to H.M.S. *Eagle*, 1.2.33. C. W. Rugg, to R.A.F. Staff College, Andover, 23.1.33.

Flying Officers: C. H. Baker, M.B.E., to No. 3 Stores Depot, Milton, 30.1.33. G. Blinman, to No. 13 (A.C.) Sqdn., Netheravon, 30.1.33. A. Wall, to School of Stores Accounting and Storekeeping, Cranwell, 27.1.33. E. F. Smith, to Station H.Q., Boscombe Down, 30.1.33.

Accountant Branch.

Flight Lieutenants: J. F. R. Eales-White, to R.A.F. Record Office, Ruislip, 30.1.33. H. E. Cardwell, A.F.C., to R.A.F. Reception Depot, West Drayton, 30.1.33.

Flying Officer H. D. Connor, to H.Q., Aden Command, 10.1.33.

Medical Branch.

Flight Lieutenants: A. H. Barzilay, to Station H.Q., Biggin Hill, 30.1.33. H. R. Clein, to Station H.Q., Netheravon, 30.1.33. G. E. Church, to Palestine General Hospital, 27.1.33.

Flying Officers: L. M. Corbet and A. H. Osmond, to Med. Training Depot, Halton, 16.1.33, on appointment to Short Service Commn.

Dental Branch.

Flight Lieutenant J. M. Jamie, to Home Aircraft Depot, Henlow, 30.1.33.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

Lieut. R. C. Tillard, (F/O., R.A.F.), to *Glorious*, for 461 Flight (Feb. 20).

ROYAL AIR FORCE

Squadron Leader P. J. Barnett, M.C., to *Eagle* (Feb. 1).

Flight Lieuts.: H. L. Beatty and G. E. G. Lywood, to R.A.F. Depot (Jan. 13 and 24 respectively); and P. J. A. Hume-Wright, to *Eagle* (Feb. 1).

55 Squadron (R.F.C. and R.A.F.) Association

THE fifteenth Annual Reunion Dinner of the above will be held at the Royal Air Force Club, 128, Piccadilly, London, W, on Saturday, March 4, at 7.30 for 8 p.m. The annual subscription of 10*s.* 6*d.* will admit members to the Dinner, and they may bring guests at a charge of 11*s.* 6*d.* each. All past members of 55 Squadron who have not received a circular are requested to communicate with the Hon. Treasurer, Capt. L. B. Goodyer, "Nithsdale," 14, Egmont Road, Sutton, Surrey.

The Royal Air Force Memorial Fund

THE usual meeting of the Grants Committee of the Fund was held at Iddlesleigh House on February 2. Mr. W. S. Field was in the Chair, and the other members of the Committee present were:—Mrs. L. M. K. Pratt Barlow, O.B.E., Air Commodore B. C. H. Drew, C.M.G., Mrs. F. V. Holt. The Committee considered in all 11 cases and made grants to the amount of £205 19*s.* 6*d.*

Transfer of Officers to the Reserve

THE undermentioned short service, medium service, and non-permanent officers should note that they become due on the dates stated for transfer to the reserve, on completing their period of service on the active list:—

Flight lieutenants:—

John Renwick Brown, August 4; Eustatius William Barton Griffiths, M.B., Ch.B., August 5; Frank Cecil Farrington, M.C., August 20; Brendan Leo Harrington, B.D.S., August 27; and Robert Duncanson, August 31.

Flying officers:—

Wilfrid Sydney Charles Adams, Richard Arnold Beynon, David Archibald Craik, Roderick Jones, George Stephen King, Maurice Gordon Parker, and Singleton Powell Richards, August 24; John Ennis Beynon, Basil Adair Blythe, Arthur Laurence Brain, Charles Michael Dalby Chambers, Herbert Rowdon Collins, Harold Arthur Fenton, Humphrey Raymond Hughes-Hallett, Frederick Alexander McNeill, Colin Campbell Charles Manson, George Oswald St. John Morris, Michael Patrick O'Reilly, Kenneth Wright Pell, Alexander Frank Powell, Cyril Ray, Louis Percy Rowley, Denis Frank Satchwell, and Joseph Stuart Shakespeare, September 14.

THE AMSTERDAM—BATAVIA WEEKLY SERVICE

(*Concluded from page* 158)

tanks and cowlings, and had stated that the use of the material for chairs had been discontinued because of corrosion. If that were so, were not the tanks and cowlings also affected? He would also like to be told a little more about the Bakelite plywood to which Mr. Plesman had referred. He was, he said, more interested in the types of machines which the K.L.M. were intending to employ in the future than in those they had used in the past, or were using at present, and he would very much like to see pictures of the Fokker F.36 in which they were hoping to get accommodation for 16 passengers. At present the division seemed to be that there were four seats for crew and four seats for passengers. That seemed a disproportionate ratio, unless one were used to driving about in a Rolls-Royce, occupying the rear seat oneself, and with a chauffeur and footman in front. That, however, would not be called economical transport.

Mr. Hall questioned the lecturer's reference to the greater cost involved in purchasing and operating seaplanes, and would like more information on that point. With regard to engines, the lecturer had stated that the American engines used by the K.L.M. were capable of 400 to 500 hours between overhauls, but that they were not allowed to do more than about 290 hours. In this country we got 600 hours out of our engines, and had hopes of increasing this to 1,000 hours. He was in favour of longer periods between overhauls, because not only were fewer spare engines required, but the expense entailed in overhaul was less, since it cost nearly as much to overhaul an engine after 300 hours as it did to overhaul it after 600 hours. With reference to the electric thermometers used on the K.L.M. engines, he did not altogether trust these instruments, and thought that the switch box used in the circuit might give rise to wrong readings. In spite of Mr. Plesman's assurance that the cartridge starter did not harm the engines, he was not in favour of the type, and preferred the gas starter. On the subject of the number of engines, Mr. Plesman had said that they wanted machines which could fly on two out of three. Imperial Airways preferred to be able to fly on three out of four, or better still, on four out of five.

Mr. Handover, the traffic manager of Imperial Airways, said that he worked in the closest co-operation with Mr. Martin, who held a similar position with K.L.M., and he was most grateful for the help he had received.

Mr. Plesman, in his reply to the D.C.A., said that last year they had used the west coast of Burma, but they found that the aerodrome at Victoria Point was too enclosed. Moreover, Kolak usually had the better climate, and even when this route was being used and Bangkok aerodrome was found to be too soft, they went over the other side again to Kolak. In answer to Col. Barrett Lennard, he said it was certainly not too difficult for them to change their route as they had very little ground organisation on that route to worry about. Referring to Col. Barrett Lennard's list of figures and comparisons, he said it was not his intention to make any comparison between his firm and any other in any way whatsoever; all he came over to do in his lecture was to give his audience the story of how the K.L.M. built up their line to Batavia. It might not be interesting, he said, but it was the way *they* had done it. He quite agreed that on some stretches of the route the use of large flying boats might have been a better solution, but they did not have the money to buy big boats. Of course, he said, they found a very great deal of interest in both the Handley-Page machines and the Atalanta class, but again he felt that that was a matter outside the scope of his story. With reference to the figures quoted by Col. Barrett Lennard, if one wanted to start making comparisons of that kind, then it would be necessary to compare the expenditure which both companies had made.

Their machines were run in exactly the same way as ships, the crew *did* work in shifts, and later on with the F.36 they were proposing to carry three pilots so that they could work in three watches, so to speak, instead of only having the two. The doctor's reports as a result of observations taken throughout the flight to Batavia and back were most encouraging, and had shown that the pilots were in better condition physically on their return to Amsterdam than when they set out. He thanked Sir John Siddeley most heartily for his kind remarks and said that appreciation from Sir John was appreciation indeed. Replying to Mr. Handley-Page, he said that the F.12 was not really too heavy, it was only that they wanted to alter it so that they could carry more load. Referring to the Bakelite three-ply, he said the great advantage of this for the tropics was its lack of absorbent qualities, which made it excellent as a top covering for the wings. Mr. Plesman regretted that as yet no picture of the F.36 existed. He explained, however, that the foremost cabin contained four bunks, the next cabin eight seats, the next four bunks, and the aftermost eight seats, thus allowing eight passengers to travel throughout the whole route, and eight more for short journeys. Arrangements were in hand to substitute bunks for some of the seats as required, so that eventually they hoped to be able to carry a full load of passengers from Amsterdam to the Far East. Mr. Handley-Page had queried the proportion of crew to passengers, but Mr. Plesman pointed out that they provided a mail service with passenger accommodation, and the number of crew was therefore decided by the mail requirements. Answering Mr. Hall, Mr. Plesman agreed that they wanted engines which ran for a thousand hours, and he said in Europe they ran their "Wasps" for 500 hr., but at present the importance of the lack of trouble on the Indian route made them consider it inadvisable to run the engines in the machines used on that route for more than 300 hr. They wished to play for safety all the time, and until the oil was better they did not think that they should be overhauled at longer intervals.

Col. the Master of Sempill then proposed a most hearty vote of thanks to the speaker. He congratulated Mr. Plesman on the success of the company and on his lecture, which was delivered with his accustomed punch, and was also a tribute to his knowledge of the English language. He hoped that continued collaboration with Imperial Airways would result in better development in civil aviation for both countries.

The Australian Air Mail

Sir Philip Sassoon, Under-Secretary of State for Air, in reply to a question by Capt. Macdonald in the House of Commons on February 8, said that the British air-mail route to Australia via India and Malaya would be inaugurated at the earliest possible date. In the absence of unforeseen delays he should hope that the regular service would be in operation by the late summer or early autumn.

"Southamptons" for Turkey

The Supermarine Aviation Works (Vickers), Ltd., Southampton, have received an order from the Turkish Government for six metal-constructed "Southampton" twin-engined flying boats. These are to be fitted with "Hispano Suiza" 12 NBR engines.

Aircraft Repairs at Hanworth

Few workshops we have seen are laid out to better advantage than the repair shops at Hanworth so ably managed by Capt. E. D. Ayre. It is certainly true that a very fair measure of workmanship of any factory can be gauged from the state that factory is in, and we were not surprised therefore, after having a general look round, to find that the work turned out was of the highest. One of the machines inspected was the "Puss Moth" belonging to the Anglo-American Oil Co. (Pratts). Some time ago Mr. B. Handstock had the misfortune to damage the machine while making a forced landing in very difficult circumstances due to weather. N.F.S. have now completely repaired and repainted this "Puss Moth" with really excellent results. Capt. Ayre believes in orderliness as a vital necessity and any visitor should, after inspecting the shops, see the stores. Everything there is very carefully arranged so that absolutely no time is wasted in procuring the right article when it is required. This department of N.F.S. not only repairs machines on the spot, but also undertakes the collection of crashed machines, or the repair of damage *in situ* when the occasion arises. For example, they collected Miss Amelia Earhart's Lockheed "Vega" from Londonderry, Donegal, and had the machine on show in Selfridge's window in London, all in five days. This was a particularly difficult piece of work, as not only was a gale blowing when they went to get the machine, but it had been landed on a comparatively steep slope. As could be imagined, it was then extremely awkward to handle the massive one-piece wing and to load the whole machine on to a lorry. A machine of interest to be seen in the shops at the present moment is the Fairey "Fox," which has been acquired by Mrs. Bruce. This is being overhauled and may shortly be airworthy, so that we may expect to hear of some new record attempt before long.

"From the Clubs"

[*Note.*—Much matter of interest in "Club Notes" has unavoidably been omitted in this issue of Flight owing to pressure on space. Items of interest which have been left out will be included in next week's issue.—Ed.]

IMPORTS AND EXPORTS

Aeroplanes, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see Flight for January 25, 1912.
For 1912 and 1913, see Flight for January 17, 1914.
For 1914, see Flight for January 15, 1915, and so on, yearly, the figures for 1932 being given in Flight, January 19, 1933.

	Imports		Exports		Re-exports	
	1932.	1933.	1932.	1933.	1932.	1933.
	£	£	£	£	£	£
Jan. ..	2,456	2,073	122,942	82,963	863	827

PUBLICATIONS RECEIVED

Clang Electrical Accessories. Clang, Ltd., Crown Yard, Cricklewood, London, N.W.2.

Squadron 95. By Harold Buckley. The Obelisk Press, 338, Rue Saint-Honoré, Paris. Price Fr. 100.

Death in the Air: The War Diary and Photographs of a Flying Corps Pilot. London: Wm. Heinemann, Ltd. Price 8s. 6d. net.

What's Wanted: A List of 895 Needed Inventions. Compiled by The Institute of Patentees, 39, Victoria Street, London, S.W.1. Price 1s. Post Free 1s. 2d.

NEW COMPANY REGISTERED

S. G. BROWN, LTD., Victoria Road, North Acton, W.3.—Capital £10,000, in £1 shares. Manufacturers of and dealers in scientific instruments in general, and particularly those invented and designed by Sidney G. Brown, F.R.S., M.I.E.E., and including gyroscopic compasses, aircraft instruments and scientific instruments, and to carry on the business of manufacturers of and dealers in watches, clocks, chronometers, optical and other scientific instruments, etc. Directors: Sidney G. Brown, F.R.S., M.I.E.E., Mrs. Alice M. H. R. Brown, both of 64, North Gate, Regent's Park, N.W.8 (both directors of Telegraph Condenser Co. Ltd.).

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors.

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1931.

Published February 16, 1933

20,510. Vickers (Aviation), Ltd., and B. N. Wallis. Spars or girders for use in aircraft construction. (386,657.)
20,734. G. Grothe and J. Biesemann. Helicopter. (386,677.)
20,754. E. J. Benvenuto. Aerial motors. (386,679.)

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